Home Computing WEEKLY

An Argus Specialist Publication

No. 63
May 22-28, 1984

45p

Win a 'flight' on a real simulator

WIN video tapes and learn about your computer from MASTER CLASS

FREE Spectrum screen designer

Software reviews for: BBC, Spectrum, ZX81, Dragon, Texas, Sord

RAM-saving graphics routines for CBM 64

Games to type in for: Spectrum, ZX81 and VIC-20

How to make your Oric/Atmos make music

PLUS: U.S. Scene, news, letters, charts...

Two great FREE competitions

Battle begins over budget software

More budget-priced software has been launched, starting a three-sided battle for pocket money.

All three companies have a background in video film distribution and Mastertronic, which started the trend with a range at £1.99, reckons dealers have bought more than ¼m tapes in less than seven weeks.

Now it has been joined by Advance Computer Entertainment and Atlantis Software.

ACE boss Micky Shephard first brought out his 10 titles at £6.90 — then dropped to £2.99 when he learned of Mastertronic's pricing.

He said: "We know them very well because we market video films to the same outlets. We could not drop to £1.99 and still re-invest. I would lose money.

"Without any bias, ours are far better than Mastertronic's. All our games will be new — we

Continued on page 5

Moves to block piracy

Software duplication companies are intent on beating piracy and have released new systems which they hope will be foolproof.

Dataclone is marketing a loading system called Power Load, developed by Incentive Software, and Bibi Magnetics has a new technique called Imprint 2.

Dataclone's Power Load uses data compression techniques, reducing the loading time by more than twice. Mike Ferguson, mastering engineer, said: "At Dataclone we are in the business of copying software but this is uncopyable. I've tried my hardest and I can't break it. I have techniques which 99 per cent of the public wouldn't know about — and I can't crack it.

"I can get the headers in but that's as far as I can get. These tapes won't audio copy or machine copy. The technique is that it is on fastload. Tapes which would normally load in five minutes on the Spectrum

Continued on page 5

£5.50

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Home Computing WEEKLY

AD ASTRA
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GARGOYLE GAMES
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SOFTWARE REVIEWS

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A page of games reviews for BBC micro owners

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Choose here for your ZX81, Spectrum or TI-99/4A

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Will these help now you're back in class?

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Games for BBC, Sord, Dragon/Tandy Colour

SPECIALS

Flight simulator competition 7
You could take to the "air" in a real flight simulator. There's 25 Fighter Pilot tapes from Digital Integration for runners-up

Masterclass video tape competition 15
Just watch and learn about computing on the Spectrum, VIC-20, BBC, Electron or Commodore 64. Thirty tapes must be won — and there's a 10 per cent discount voucher for every entrant

Spectrum screen planner 25
Create great graphics and plot them on the screen with our special pull-out Pixel-Pad

● There's listings for these computers — and more — in this issue of Home Computing Weekly

PROGRAMS

ZX81 8
Zap them before they blast us — a fast-moving space game for the 16K ZX81

Spectrum 12
Two games: rescue a maiden in distress and go for gold in the 400 metres

VIC-20 16
Two games: Galaxy is for the unexpanded VIC and Pilot 20 needs 3K expansion

Commodore 64 35
RAM-saving graphics — five listings and four demonstration programs to type in and use

Oric/Atmos 42
Type in our synthesiser and your computer is a musical instrument. And you can play back your masterpieces

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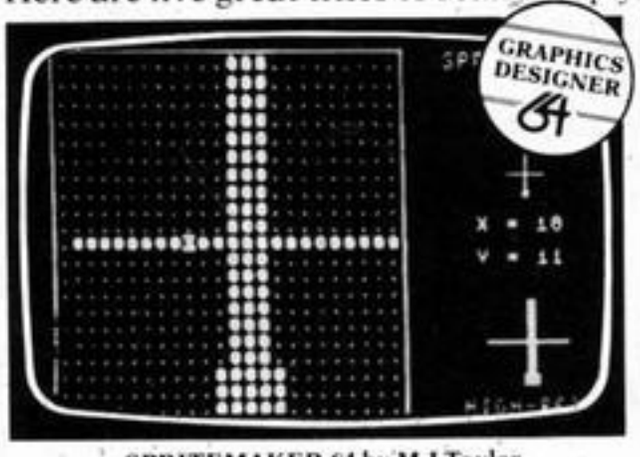
Develop your programming skills with English Software.

Here are five great titles to really help you enhance your programming abilities.



SPRITEMAKER 64 by M J Taylor
Design and save beautiful multi-coloured sprites, and then use them in your own programs. Full editing facilities under cursor control included. Saves files to cassette and disk. **ONLY £6.95**

SUPERFONT 4-0 by Stephen A Riding
Our character generator lets you re-define and shape your own character sets. Full editing facilities under cursor control included. Saves files to cassette and disk. **ONLY £6.95**

ATARI GRAPHICS WIZARD by Stephen A Riding
The Atari Graphics Wizard introduces you to the wonderful world of Atari Player (Sprite) and Character Graphics. Written totally in Machine Code, it contains Player Editor (Sprite Maker), Character Editor and Multicolour Character Editor. Operates via keyboard or joystick, full documentation supplied with each program. Soon, animated graphic capability will be at your fingertips! **ONLY £9.95**

ACE, THE ATARI CASSETTE ENHANCER
by Jon Williams Cassette features include ★ Names cassette-saved programs Searches and loads named program ★ Displays contents of cassette on screen ★ Verify facility ★ Lists variables ★ Automatic line numbering ★ Renumbers any basic program quickly ★ Creates binary files on tape ★ Plus many, many more features ★ Uses only 4K of memory maximum! **ONLY £7.95**

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ES FORTH by A Kozakewycz

ATARI 400/800 & XL MODELS 32K

ES Forth unlocks the door to the wonderful world of Forth at an affordable price! Up to 100 times faster than BASIC, yet easy to learn and easy to use. ★ Basic dictionary compatible with FIG-FORTH ★ Many general purpose extensions ★ Full screen editor ★ Complete set I/O extensions ★ Built in editor definitions ★ Use with Atari Assembler Editor for debugging and machine code linking ★ Sound commands ★ Atari Basic compatible graphics commands ★ Automatic control of Player-Missile graphics ★ Complete set of controller commands ★ User selectable number of editing screens. **ONLY £14.95**
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(All English Software programs are sold according to the English Software Terms of Trading, copies of which are available on request.)

To the English Software Company, Box 43, Manchester M60 3AD
Please send on cassette/disk

- ☐ ES Forth at £14.95
- ☐ Atari Graphics Wizard at £9.95
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- ☐ Superfont 4.0 at £6.95 cassette (CBM 64)

I enclose cheque/PO for £_____ (Post Free) or please debit my Access/Visa No _____

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HCW63

ENGLISH SOFTWARE
THE POWER OF EXCITEMENT

Battle

From front page

won't re-package old stuff. We don't want to be in that area. There's an old adage that you only get what you pay for."

He said his range — which would increase by 10 next month — was prepared by Galactica Software, run by Richard Darling and sons Richard and David.

Mr Shephard said: "This summer we believe there's going to be a big price drop generally to around £3.50-£3.99.

"The industry has got its head in the sand. They are making too much product and there are not enough customers. It's the cart before the horse."

He said he had done 10 times the business in seven days, compared with the previous three weeks, since his price cut.

Atlantis Software was bringing out its first four titles this week, all at £1.99, with another four within a month.

Managing director Mike Cole said: "We decided to market some games cassettes and we thought there was something that was not quite right with the market. There are about 2½m computers but the average game sells 3,000 to 5,000, although the biggies sell more. Then we looked at the prices and it seemed that pocket money prices were the way to do it. Mastertronic did their maths the same way.

"All our software is from well respected software houses. They have not been published before and they are not second-rate games. Originally we were going to market them at £5.95 to £6.95."

Alan Sharam, of Mastertronic, said: "We have established ourselves and the games are selling, but we are not complacent. And any suggestion that we are coming in to slaughter the software market is nonsense."

Nick Alexander, chairman of the Guild of Software Houses and managing director of Virgin Games, said he felt that the market was not yet big enough for budget priced software.

He said: "They have got to sell a lot or the sums just don't add up.

"I feel that there's no reason why full price and budget price software shouldn't sell side by side. There is a big danger, however, that people will over-react and pull down their prices. The video and the record industries learned that mistake to their cost."

All three of the new software companies are selling direct to retailers through teams of sales people. Most outlets are the estimated 14,000-16,000 video film rental shops, but others include petrol stations, newagents and grocers. Conventional software distributors and the big high street chains were also taking an interest, they said.

Mastertronic, 42 Welbeck Street, London W1M 7HF
Advanced Computer Entertainment, 82-84 Peckham Rye, London SE15 4HB
Atlantis Software, 19 Prebend Street, London N1 8PF

Piracy

From front page

now take 2 minutes 20 seconds. The unusual timing means that the code section reads in so fast that it's impossible to copy.

"Since the tapes are quicker to load we are hoping that they will sell more. This system shouldn't make much difference to the price of software in the shops."

"Incentive is marketing this system through us," Mr Ferguson said. "Incentive processes the software and then gives us specific instructions on how to handle it. Tapes using Power Load should be on the market almost immediately. So far the Spectrum is working reliably and we are perfecting cassettes for the Commodore 64, which will load in one-third of the time."

Bibi Magnetics' new way to beat the pirates, Imprint 2, is a technique added to the master before duplication. No dongle or other hardware is necessary.

Nigel Boyle, sales manager for data duplicating, said: "There has been a lot of talk about how much income is lost through piracy. Opinions vary, but it is true that there is a significant loss through piracy. No-one will eradicate piracy, but we aim to help.

"Imprint 2 will stop the schoolkid who makes 10 copies for a friend, who then makes 10 more for another friend. Before you know it there are thousands of illegal copies. Professional pirates will also find it hard to get round this imprint technique, as each cassette will need the imprint.

"It will work on all computers on all cassettes. The price of software to the customer should not go up noticeably, unlike cassettes using the dongle. The cost to the software companies will be minimal."

Mr Boyle said: "This is the brainchild of Jim Lamont of JLC. He was involved in the Ministry of Defence ban, and he certainly knows all about piracy.

"Imprint only works for cassettes, but we also have methods of protecting discs against priacy."

Dataclone, Unit 1, Roslin Square, Roslin Rd, London W3 8DH; Bibi Magnetics, Field Way, Greenford Industrial Estate, Greenford, Middx UB6 8UN

Circuit analyser

Just out from Number One Systems: Analyser for the 48K Spectrum. This is a program to evaluate the performance of electronic circuits, enabling the circuit designer to interactively improve them without having to bench test or breadboard.

Circuits of up to 16 nodes and 60 components can be analysed for input impedance, output impedance and gain at linearly or logarithmically spaced functions.

Modifications can be made to the component values and circuit configuration during a simulation, so that the designer can quickly assess the circuit's sensitivity to component tolerances, temperature and stray capacitances.

Number One Systems believe this program will be of interest to students and junior engineering staff. Versions are also available for the BBC B and Newbrain. Cost of cassette: £35.

Number One Systems, 9A Crown St, St Ives, Huntingdon, Cambs PE17 4EB

Win £500 in the GLC Anti-Racist Computer Game Competition! The GLC will award this prize to the winning designer of a space invaders-type quiz around racial issues. You must be an amateur, and the programs you design must run on the BBC B or Spectrum. Closing date is 8 June 1984. Contact the GLC for entry details.

Computer Game Competition, GLC, Director-General's Dept (DG/EMU), Room 686, County Hall, London SE1 7PB

You could be on our pages

We welcome programs, articles and tips from our readers. If you feel that your work meets our standards, please submit it to us for consideration for publication.

- **Programs must always be sent on cassette. Listings are helpful, but not necessary. Check carefully that they are bug-free. Include details of what your program does, how it works, variables you have used and hints on conversion.**
- **Articles on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCW. Articles most likely to be published will help our readers make better use of their micros by giving useful ideas, possibly with programming examples. We will convert any sketched illustrations into finished artwork.**
- **Tips are short articles, and brief programming routines. Your hints can aid other computer users.**

All submissions will be acknowledged and the copyright in such works which will pass to Argus Specialist Publications Ltd will be paid for at competitive rates.
Keep a copy of your work and include an SAE. Label everything clearly and give a daytime and home phone number if you can.
All work for consideration should be sent to:

Paul Liptrot, Home Computing Weekly, No.1 Golden Square, London W1R 3AB

NEWS

Learning is fun

Play and learn with Clever Clogs, those five pre-teen cousins who have recently linked up with Argus Press Software. Two new games have just been released: Star Trucker for age 9+ and Music for 7+.

Space Trucker: your mission is to reach beyond hyperspace and bring back power crystals. You must answer questions correctly in order to be able to buy fuel and commodities or increase the Force Field. Your aim is to fulfil your task in the shortest possible time — then you can print out a Space Commission certificate if you are successful.

Music: This package is three tapes in one — Piano Player, Composer and Musical Quiz. The program can be updated or the difficulty level increased.

Argus Press Software, No. 1 Golden Square, London W1R 3AB

Play and learn

New from Comsoft: Staircase Stampede, for the BBC 32K micro. Humphrey struggles to paint the staircase while being pursued by Horrible Harold and Helpful Horace. Watch out for exploding bombs or crushing boots! Cassette costs £7.50; 40 track disc £9.50.

Also from Comsoft for the BBC 32K and Electron: Playbox, a combination of three programs on one tape. Memory is a game for two, in which you must pair off a series of pictures; Hangman has a vocabulary of 280 words and Bricksmash keeps you trapped behind a brick wall until you can break out by answering the general knowledge questions.

Price for this package is £6.50 for cassette and £8.50 for 40 track disc.

Comsoft, 7 Roman Drive, Leeds, West Yorks LS8 2DR

Fantasy fun

The Lords of Midnight is a new game from Beyond for the 48K Spectrum. Described as "a living fantasy novel," it's an epic game which has similarities to the Lord of the Rings.

You may use your Spectrum printer to print out a pictorial record of the game, and Beyond is offering to turn the adventures of the first successful candidate into the first ever computer-generated novel. Price £9.99.

Beyond, Durrant House, 8 Herbal Hill, London EC1R 5EJ

Mammoth micro shop

What is reputed to be the world's largest computer store has opened in London, at Stonebridge Park on the North Circular. Steiger has dedicated 25,000 square foot of floor space to home and business computers. Software is also catered for; both educational and games packages are sold at competitive prices.

John Patterson, director, said: "For the first time customers have got everything they need under one roof, from the smallest computer to a dedicated multi-user system."

He continued: "We support our products with skilled, trained people. Our programme of after sales support and maintenance is second to none. Our long-term aim is to open a chain of Steiger-owned or franchised shops and achieve nationwide coverage."

● As an introductory offer, Steiger is deducting up to 20 per cent from an Apple system, and permitting a seven-day free trial.

Steiger House, North Circular, Stonebridge Park, London NW10 7QZ

Face foes, rescue maidens!

Four more games and one utility are just out from English Software for Atari, each costing £9.95. In the Adventures of Robin Hood, foil the Sheriff of Nottingham, steal the silver and rescue Maid Marian!

Brian the Blob has stolen the great Diamond and hidden it in the deepest vault. In Dan Strikes Back, you must make your way through the vault, avoiding the creatures and trampling on the mushrooms.

Citadel Warrior 32K is a game in which your mission is to save the world from evil forces, set on destroying security citadels with their cyclotron bombs. Neptune's Daughters is an original game in which the Sea Serpent seizes Neptune's beautiful daughters and carries them off to his lair. Your task is to brave the Sea Serpent and rescue the maidens.

Atari Graphics Wizard enables you to create new characters and edit and create players (sprites) at the same time. It eliminates the need for a separate player and character editor.

English Software, Box 43, Manchester M60 3AD

U.S. SCENE

Cut-price CBM 64 music box

My attention is drawn most readily to programs having to do with music. Therefore, I was attracted to the announcement by Human Engineered Software (HES) of its latest product for the Commodore 64. It is called Synthesound 64. As you may know, the 64 has a chip inside it called SID (for Sound Interface Device) that is capable of producing all sorts of neat noises.

Unfortunately, it was designed to be PEEKed and POKEd from BASIC, which is a very tedious, not to mention time consuming and technical, way of getting the job done. In this manner it usually takes hours to design tunes that play for seconds. But that is all over now. Using the HES program, you no longer have to be a programming genius to get fantastic results. You will need some specialized knowledge of musical synthesizers, but that knowledge is passed along to you by the program itself, which in addition to being useful is also educational.

The program teaches all about the common electronic music buzzwords and acronyms, as well as teaching about the limitations and capabilities of the SID chip. The program allows the creation of up to eight low frequency oscillators, two piano-style keyboards displayed on the screen, is able to store and recall up to 256 predetermined pitch settings, and uses the disc drive as a "tape recorder" on which you can store as many as nine tunes and nine sets of 256 predetermined settings. A sample demo is included with the program which shows off its tremendous capabilities.

Among other things, the program is capable of producing three-note chords, something which, until very recently, all except the most expensive music synthesizers were not capable. Even at present, the most reasonable priced three-voice synth costs lots more than a CBM 64 system. It is also possible to match the pitch of the unit to other instruments by using the left and right arrow keys to increase or decrease the pitch in gradual increments — while playing in real time!

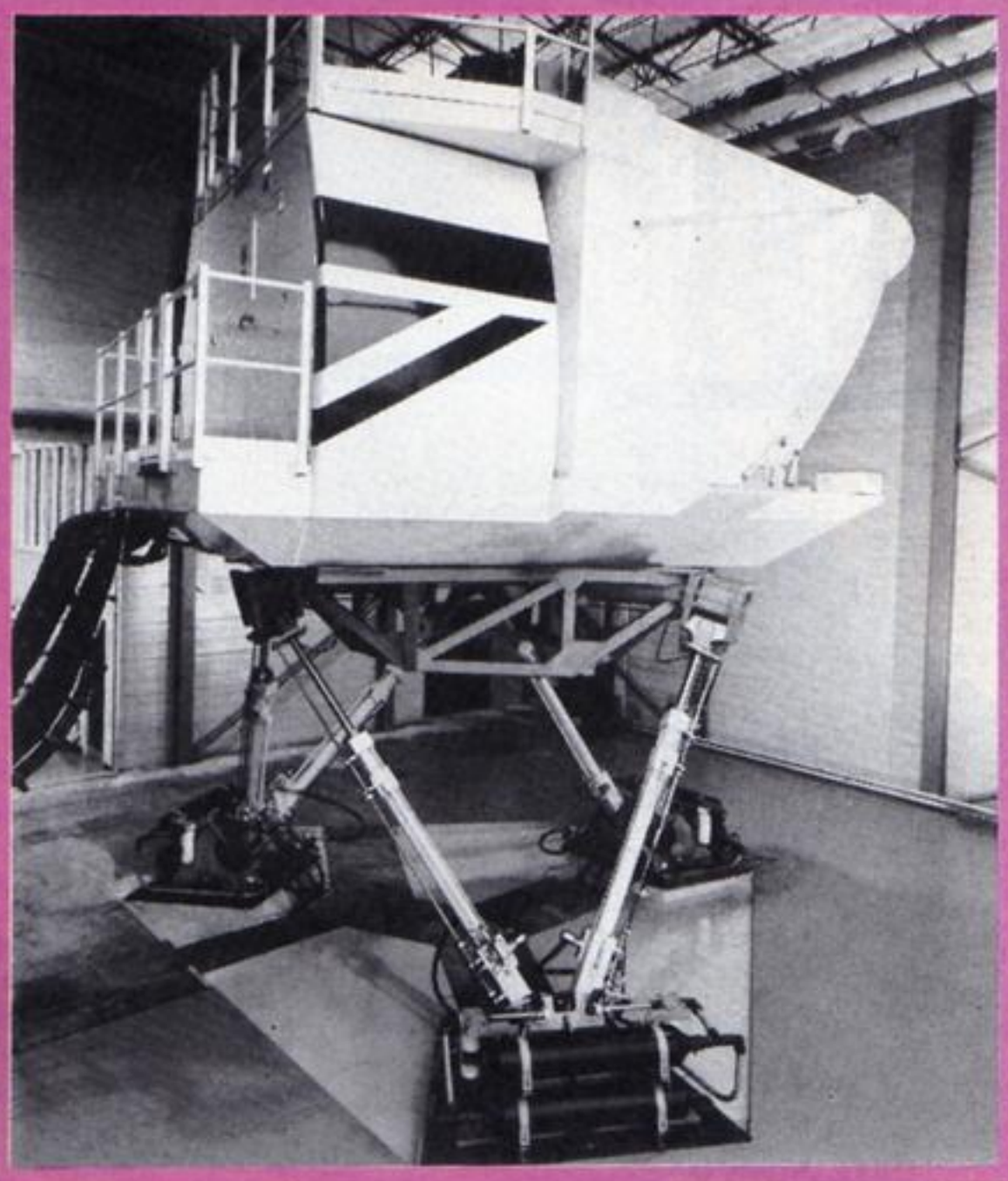
The program does have some limitations of which you should be aware. Its error handling is less than superb and occasionally the keyboard will go dead, requiring a complete reboot. Since the keyboard is used for entering the notes, it is obviously not going to be played as efficiently as a real keyboard instrument, nor is the sound going to resemble that produced by a commercial-grade synth. Still, no other special hardware is required to produce music, and there seems to be no other place you can learn so much about electronic music for such a low price.

The program costs all of $19.95! If unavailable from your local HES dealer, you can enquire directly to Human Engineered Software, 150 North Hill Drive, Brisbane 94005, (415) 468-4111.

Hands Across The Water Dept. *Our GTE (General Telephone and Electronics) Telenet Communications and British Telecom have just announced a jointly developed system of transmitting telex messages faster and cheaper. The new service does not require any specialized telex equipment other than standard terminals and micro computers — or even dedicated word processors — in order to send messages to the U.K. The system is called Interstream One, and will reduce the cost of standard telex communications from $2 or $3 per minute to as low as 17 cents per minute plus .08 cents for every 400 characters transmitted. Say, that's a more efficient way of getting my column to you...*

No more space now. See you next week.

Bud Izen
Fairfield, California



Come fly with us

FASTEN your seat belt and prepare for take off!

This is your chance to win a once in a lifetime trip. However, you won't be going anywhere — you'll just think you are. Rediffusion simulators make you think you're flying while you stay in the same place.

Be the envy of your friends when you take a ride in a simulator in which civilian and military pilots train.

You'll travel to Rediffusion's head offices in Crawley, near Gatwick. You must be 10 or over and accompanied by an adult. Home Computing Weekly will pay for your travel expenses.

Rediffusion Simulation is the largest simulator products manufacturer in Europe. The aim of flight simulators is to create a realistic environment so trainee pilots can learn through practice. The flight deck has authentic instruments. A computer creates lifelike scenes.

You can choose your weather — snow, ice, rain, thunder or make it easy and go for fine weather — as well as time of day or night.

Each of Rediffusion's simulators costs £5m and there is a comprehensive range from BA146 to Boeing 747.

As a lasting souvenir of this memorable and exciting day out, Rediffusion will send you a photograph of yourself in control of your aircraft.

Additional prizes to keep you airbound are 25 cassettes of Fighter Pilot from Digital Integration for the 48K Spectrum. Usual price: £7.95.

Transform your front room into a simulator as you play this real time game. Based on the USAF jet fighter, the F15 Eagle, the 3D graphics give you the illusion of reality.

The creator of Fighter Pilot, Dave Marshall, is an expert — he's a former Ministry of Defence pilot and he's flown Hunters and Jet Provosts, so he's got inside knowledge.

So what are you waiting for? The competition is as straightforward as all the previous ones. Don't forget to write your age on your entry coupon.

How to enter

Hidden in the wordsquare are a number of aeronautical terms. Look closely and try and find as many terms associated with aircraft as possible. Mark these words with a ballpoint or semi-opaque felt-tip pen. Complete the coupon fully and clearly — if you are a winner it will be used as a label — and send the wordsquare and coupon to us.

Important: you must write on the back of the envelope the number of terms you found. Don't forget to write your age on the coupon.

You may enter as many times as you wish provided each is on the official wordsquare and coupon and in a separate envelope. Copies will not be accepted. Please do not enclose anything else.

Send your entry to Simulator Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB.

Closing date is at first post on Friday June 8, 1984. The top prize, a ride in a Rediffusion simulator, will be awarded to the sender of the first correct entry opened at random. Runners-up will be the senders of the next 25 correct entries opened at random; they will receive a copy of Fighter Pilot from Digital Integration for the 48K Spectrum.

The winner of the simulator prize must be accompanied by an adult companion. The trip to Rediffusion offices in Crawley will be on a date convenient to Rediffusion. Home Computing Weekly will cover surface travel expenses from a mainland U.K. address.

Software will arrive from Digital Integration within 28 days of the results appearing in Home Computing Weekly, or earlier.

This competition is restricted to entrants over the age of 10.

The rules

Entries will not be accepted from employees of Argus Specialist Publications, Rediffusion Simulation, Digital Integration and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies. The rules include the guidance in the How to Enter section. The editor's decision is final and no correspondence will be entered into.

A	U	G	S	I	M	U	L	A	T	O	R	C	B	H	B
F	N	D	J	Z	E	C	D	I	L	A	J	M	D	I	F
K	D	E	C	K	Y	F	I	R	A	D	A	R	X	D	L
A	E	L	O	E	G	V	G	C	B	W	M	F	C	H	I
Y	R	F	C	O	G	H	U	R	N	J	O	Z	T	H	G
N	C	I	K	X	R	I	E	A	P	S	J	Q	K	P	H
D	A	Q	P	L	A	K	W	F	I	G	H	T	E	R	T
N	R	M	I	P	I	L	O	T	R	L	V	H	P	O	D
P	R	C	T	S	R	T	M	O	Y	N	T	R	W	Q	E
L	I	R	O	Q	F	B	M	S	P	A	R	O	N	S	C
T	A	R	K	P	I	S	Q	U	J	Q	V	T	S	U	K
V	G	R	U	G	E	B	O	J	E	T	W	T	N	S	H
X	E	L	E	Z	L	T	A	F	X	Y	M	L	Y	U	D
V	Z	V	K	Y	D	A	F	D	W	J	Z	E	C	A	B
C	J	O	Y	S	T	I	C	K	H	B	X	C	D	B	E
W	G	X	Y	E	C	Z	E	A	R	U	N	W	A	Y	F

Simulator Competition

Entry Coupon

Name _____

Address _____

_____

_____

_____ **post code** _____

Age **Number of titles found** _____

Complete clearly and fully — if you are a prizewinner this will act as a label. Post to Simulator Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. Closing date: first post, Friday June 8, 1984. Follow carefully the advice in the How to Enter section, including writing the number of titles you found on the back of the envelope

```
  1 REM "ALIEN"
  2 GOSUB 5900
  3 DIM R(21,31)
  4 LET LIVES=159
  5 DIM A(5)
  6 DIM A$(2,3)
  8 LET A$(1)="
  9 LET A$(2)="
 10 LET SCORE=0
 12 LET Z=16
 13 LET S$="
                "
 14 LET V=20
 16 LET W=0
 17 FOR X=0 TO 21
 18 PRINT AT X,0;S$
 20 NEXT X
 25 FOR D=1 TO 5
 26 LET A(D)=D*5
 27 PRINT AT 3,D*5;A$(1);AT 4,D
*5;A$(2)
 28 NEXT D
 29 PRINT AT 0,0;"HI-SCORE=
BY>
 30 PRINT AT 16,2;"          ";AT
 17,2;" SCORE ";AT 18,2;"  ";SCORE
;AT 18,8;" ";AT 19,2;"          "
 31 PRINT AT 21,16;CHR$ LIVES;A
T 0,9;HISCORE;AT 0,19;F$
 32 FOR S=1 TO 27 STEP 3
 33 LET R(10,S)=2
 34 LET R(10,S+1)=2
 36 LET R(12,S+2)=2
 38 LET R(12,S+3)=2
 39 LET R(8,S+3)=2
 40 LET R(14,S)=2
 42 LET R(14,S+1)=2
 43 LET R(8,S+2)=2
 44 NEXT S
 45 FOR S=1 TO 27 STEP 3
 46 PRINT AT 10,S;"   ";AT 12,S+
2;"   ";AT 14,S;"   ";AT 8,S+2;"
 47 NEXT S
 100 PRINT AT 5,3;"
                    "
 105 PRINT AT 21,15;"  ";AT 21,17
;"  "
 110 LET B=INT (RND*5)+1
 120 IF A(1)=0 AND A(2)=0 AND A(
3)=0 AND A(4)=0 AND A(5)=0 THEN
GOTO 1000
 130 IF A(B)=0 THEN GOTO 110
 140 PRINT AT 5,B*5;"  "
 145 FOR I=0 TO 10
 147 NEXT I
 150 FOR M=0 TO 30
 170 LET Z=Z-(INKEY$="0")+(INKEY
$="P")
 190 LET V=V-1
 200 LET P=R(V,Z)
 210 PRINT AT V,Z;"  "
 215 IF P=2 THEN GOTO 360
 217 PRINT AT V,Z;"  ";AT V,Z;"  "
 220 IF V=6 AND Z=B*5+1 THEN GOT
O 300
 225 IF V=6 THEN GOTO 325
 230 NEXT M
 300 PRINT AT 3,Z-1;"  ";AT 4,Z
-1;"  "
 310 LET A(B)=0
 320 LET SCORE=SCORE+500
 325 LET SCORE=SCORE+500
 326 LET Z=16
 335 PRINT AT 18,3;SCORE
 340 LET V=20
 355 GOTO 100
 360 LET LIVES=LIVES-1
 361 FOR Q=0 TO 6
 362 PRINT AT V,Z;CHR$ Q;AT 21,1
6;CHR$ (Q+128)
 363 NEXT Q
 364 LET Z=16
 365 PRINT AT 21,16;CHR$ LIVES
 367 IF LIVES=156 THEN GOTO 396
 368 LET V=20
 369 GOTO 45
 396 FOR S=0 TO 21
 400 PRINT AT S,0;S$
 410 PRINT AT 10,10;"GAME OVER";
AT 10,10;"
```

Oh no! The unthinkable has happened. Your 16K ZX81's ground pilot has gone berserk and has left you, the only known sane survivor, to fight off the intergalactic aliens.

What's worse is that he has caused catastrophe in the missile launching room and has put you into auto-launching mode.

How it works

2 GOSUB for instructions
3-16 set up main variables
17-20 print inverse screen
25-28 print aliens and record their positions
29-31 print score, lives etc
32-44 record barricades positions
47 print barricades
100-140 print opening under alien
150-230 main loop
300-320 alien destroyed
325 reached alien but not destroyed
326-355 print score and initialise missile positions
360-369 lose life routine
396-1200 game over routine
1210-1290 high-score routine
5900-6050 print title in large letters
6060-9179 initialise high score variables and print instructions
9900-9935 print wait routine

Your only hope is to steer the missiles at the aliens.

Easy, you may think. It's not if their targets are at the other side of reinforced, indestructible barricades. Full instructions are in the listing.

When you have mastered the game you should be able to reach scores in the region of 15-25,000.

The game can be made to run slightly faster by omitting line 210.

To make the game easier, less barricades should appear. In order to do this, omit lines 33-38 and amend line 46 to:

Main variables

RB (x,y) screen dimension
lives lives (in inverse)
A vertical alien positions
Z,V vertical, horizontal missile position
B opening under alien position
FS high scorer's name

PRINT AT 14,S; "(2 GRAPHICS H)"; AT 8,S+2;"(2 GRAPHICS H)"

Words in inverse are **410** GAME OVER, **600** SCORE=, **758** YOU HAVE EQUALLED TODAY'S HI-SCORE **WELL DONE**, **1210** YOU HAVE GAINED TODAY'S HI-SCORE **CONGRATULATIONS**, **1222** TYPE IN YOUR NAME.

The game can be SAVEd by typing GOTO 1400.

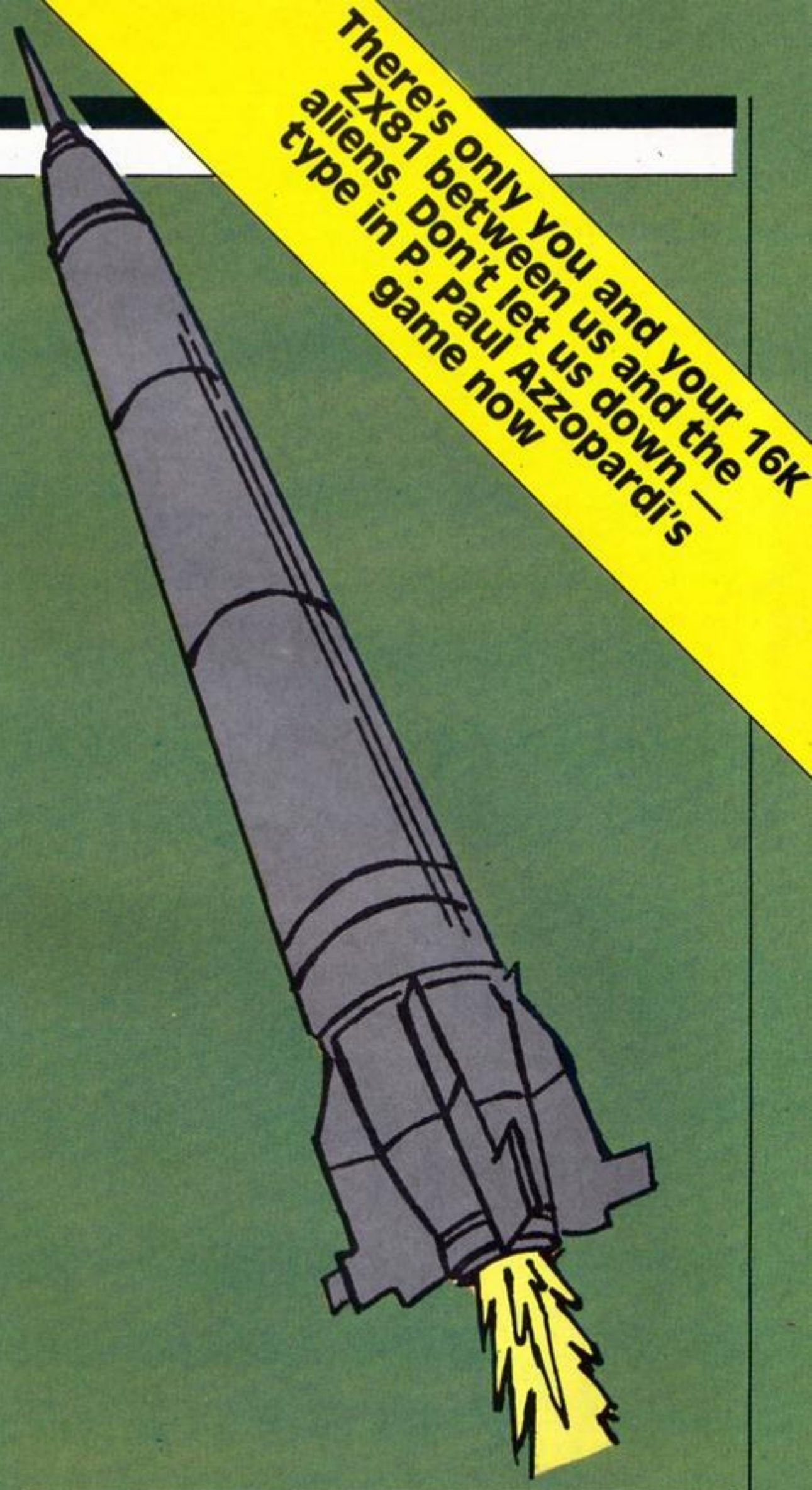
Hints on conversion

The game should not present too many difficulties to convert to other computers. The only major difference is the ZX81's character set: CHR$ 159 is inverse S, CHR$ 156 inverse 0, CHR$ 118 newline (return), CHR$ 128 onwards graphics characters.

```
 420 NEXT S
 500 PRINT AT 10,10;"
                    "
 600 PRINT AT 12,6;"SCORE=  ";SCO
RE
 601 PRINT
 756 IF SCORE>HISCORE THEN GOTO
1210
 758 IF SCORE=HISCORE THEN PRINT
```

Zap t
befor
blast

There's only you and your 16K ZX81 between us and the aliens. Don't let us down — type in P. Paul Azzopardi's game now



PROGRAM

```
  "YOU HAVE EQUALLED TODAYS HI-SC
ORE =        **WELL-DONE**"
  760 GOSUB 9900
  900 GOTO 3
 1000 LET LIVES=159
 1100 LET SCORE=SCORE+1000
 1200 GOTO 14
 1210 PRINT "YOU HAVE GAINED TODA
Y'S HI-SCORE     -**CONGRATULATIONS
**"
 1220 PRINT "          !------! "
 1221 PRINT
 1222 PRINT "       TYPE IN YOUR NA
ME"
 1230 LET F$=""
 1235 FOR O=11 TO 16
 1236 IF INKEY$<>"" THEN GOTO 123
6
 1237 IF INKEY$="" THEN GOTO 1237
 1240 IF INKEY$=CHR$ 118 THEN GOT
O 1270
 1245 LET X$=INKEY$
 1249 PRINT AT 16,O;X$;
 1250 LET F$=F$+X$
 1260 NEXT O
 1270 LET HISCORE=SCORE
 1290 GOTO 760
 1300 STOP
 1400 SAVE "ALIE"
 1500 RUN
 5900 PRINT AT 3,4;"
          "
 6000 PRINT AT 4,4;"
          "
 6010 PRINT AT 5,4;"
          "
 6020 PRINT AT 6,4;"
          "
 6030 PRINT AT 7,4;"
          "
 6040 PRINT AT 8,4;"
          "
 6050 PRINT AT 9,4;"
          "
 6060 GOSUB 9900
 6070 CLS
 9000 PRINT TAB 11;"ALIEN";TAB 11
;"       "
 9010 GOSUB 9932
 9110 PRINT ,,,"  YOU HAVE TO ST
EER YOUR MISSILE  (!) PAST THE B
ARRICADES  ()  AND THEN INTO O
NE OF THE FIVE  ALIENS WHICH ARE
 WAITING ON THE          TOP OF THE
 SCREEN."
 9112 GOSUB 9932
 9115 GOSUB 9900
 9116 GOSUB 9932
 9120 PRINT ,,"  IF THE ALEIN IS
ACTIVE YOU GET 1000 POINTS AND I
T BLOWS UP.    (YOU WILL KNOW IF
THE ALIEN IS  ACTIVE OR NOT BECA
USE IT WILL   HAVE AN OPENING AT
 THE BOTTOM)."
```

```
 9130 PRINT ,,"  AN ALIEN WILL ONL
Y STAY ACTIVE FOR A FEW SECONDS.
 IF YOU DON,T MANAGE TO HIT AN A
CTIVE ALIEN   YOU WILL GET 500 P
OINTS."
 9135 GOSUB 9932
 9136 GOSUB 9900
 9137 GOSUB 9932
 9140 PRINT ,,"  YOU HAVE 3 LIVES
AND YOU LOSE 1 EACH TIME YOU HIT
 A BARRICADE."
 9170 PRINT ,,"KEYS : Q MOVES LEF
T";TAB 7;"P MOVES RIGHT"
 9172 GOSUB 9932
 9175 GOSUB 9900
 9178 LET HISCORE=0
 9179 LET F$="??????"
 9180 RETURN
 9900 PRINT AT 18,3;"->-PRESS A KE
Y TO CONTINUE-<"
 9902 FOR W=0 TO 5
 9903 NEXT W
 9905 PRINT AT 18,3;"<-PRESS A KE
Y TO CONTINUE->"
 9910 IF INKEY$="" THEN GOTO 9900
 9920 CLS
 9930 RETURN
 9932 PRINT
 9933 PRINT
 9934 PRINT "--------------------
--------------"
 9935 RETURN
```

them before they get us...

Flex your muscles on these!

Escape from Colditz, hurl boulders at robots and chase round mazes! Our reviewers have cooled down enough to tell you how they rated these active games

Croakit
32K BBC £5.95

Kerian, 29 Gisburn Rd, Hessle, Hull HU13 9HZ

There has to be a limit to the number of versions of a single game the market can stand and in the case of Frogger I'm sure we must have reached it by now! I was somewhat taken aback therefore to receive this one for review.

It is a perfectly reasonable version with most of the features you expect: interrupt driven music routines, smooth animation and a reasonable playing speed, although I prefer the fastest version available (Croaker).

Snakes, flies, lady frogs and crocodiles all have their particular rewards or punishments in store for you. There are a few features which do make this stand out from the crowd, although I don't feel they are improvements. The frog does not change attitude when you change direction, there is only ever a forward facing frog on screen, there are two rows of logs both moving in the same direction and there can be more than one fly on the screen at once.

Rather too late to catch a mass market and not the best available I'm afraid. **D.C.**

instructions	50%
playability	60%
graphics	75%
value for money	60%

★ ★ ★

Rocky
32K BBC £7.95

Superior Software, Dept C, Ground Floor, Regent House, Skinner Lane, Leeds

This game has nothing to do with boxing!

Instructions are given during the loading process and are quite adequate. A nice extra is the revolving score table, on which you can see your name spin round, if you're good enough!

The major setback of the game is that the graphics are small. The small characters make the game appear to be really fast.

You have to kill the mutant robots by dropping rocks on them. They have one large eye which emits a yellow beam of light. If you're caught in this, your strength is sapped and if you're not carrying a rock the mutant will metamorphosise into a cruncher or spectre.

The game is situated in a maze. Two separate keys are used to pick up rocks and drop them. This makes the game very difficult. Some of you 'wonder players' out there may be able to pick up this sort of game with no problem, but slow people like myself would have great difficulty.

£7.95? Well, I wouldn't buy it. **D.B.**

instructions	80%
playability	50%
graphics	90%
value for money	60%

★ ★ ★

Bumble Bee
BBC B £7.95

Power, 8/8a Regent St, Chapel Allerton, Leeds LS7 4PE

If you like chasing and BEEing chased around mazes then this is for you. Not particularly original but certainly inventive.

It's based on a similar idea to Pac-man. You are a bee wandering around eating pollen and occasional fruit. However all is not rosy in the garden. There are hazards to watch out for. Toadstools and tasty looking foodstuffs are poisoned. Worse! Spiders appear to chase and devour you. However, there are some tricks in your favour if your reactions are fast enough.

Parts of the maze contain swinging gates which can guard your escape. Spiders can be lured to eat the food and so die!

It's an extremely colourful game with excellent graphics. There is a useful sound on/off option which meant I could play late into the night and a high-score table to satisfy the competitive player.

My only problem was with the choice of keys for movement — the asterisk and question mark were not a good idea for up and down. There is a joystick option which made it slightly easier although changes of direction were still tricky. **M.P.**

instructions	90%
playability	80%
graphics	95%
value for money	80%

★ ★ ★ ★

Planetfall
32K BBC £11.95

Argus Press Software, No.1 Golden Square, London WC2 0EE

This trading game is brought to you by the publishers of this magazine. You may be somewhat sceptical therefore when I describe it as one of the best trading type games I have seen for the BBC. My main reason is not that I like working here but that it is the most understandable trading game I have played, with simple rules but interesting and lively action.

The program has 11 different screen displays, all attractively laid out in teletext with plenty of colour and sound. You have many options and can alter skill levels and time span.

You pilot a cargo ship around the galaxy buying and selling as you go and at each stop you have the chance to haggle over the prices. For anyone with a passion for games playing it will be a wonderland.

The only difficulty I have had is trying to get to the bank as the instructions don't give enough detail on this aspect. An exciting two- or more player game which is a little overpriced but good fun. **D.C.**

instructions	70%
playability	95%
graphics	80%
value for money	80%

★ ★ ★ ★

Colditz
32K BBC £8.65

LVL, Electron House, Bridge St, Sandiacre, Notts

A nice extra here is a sheet explaining how to run this program with a 0.10 operating system. The loading instructions are very clear and a 16-page booklet is included.

As you may have guessed, Colditz involves you escaping from the German POW camp. The screen displays a map of the level you are on. Using the cursor keys you can move around searching for escape routes and equipment.

A door which is normally closed has a German guard outside. If you show him your pass, you may enter. Other doors need keys.

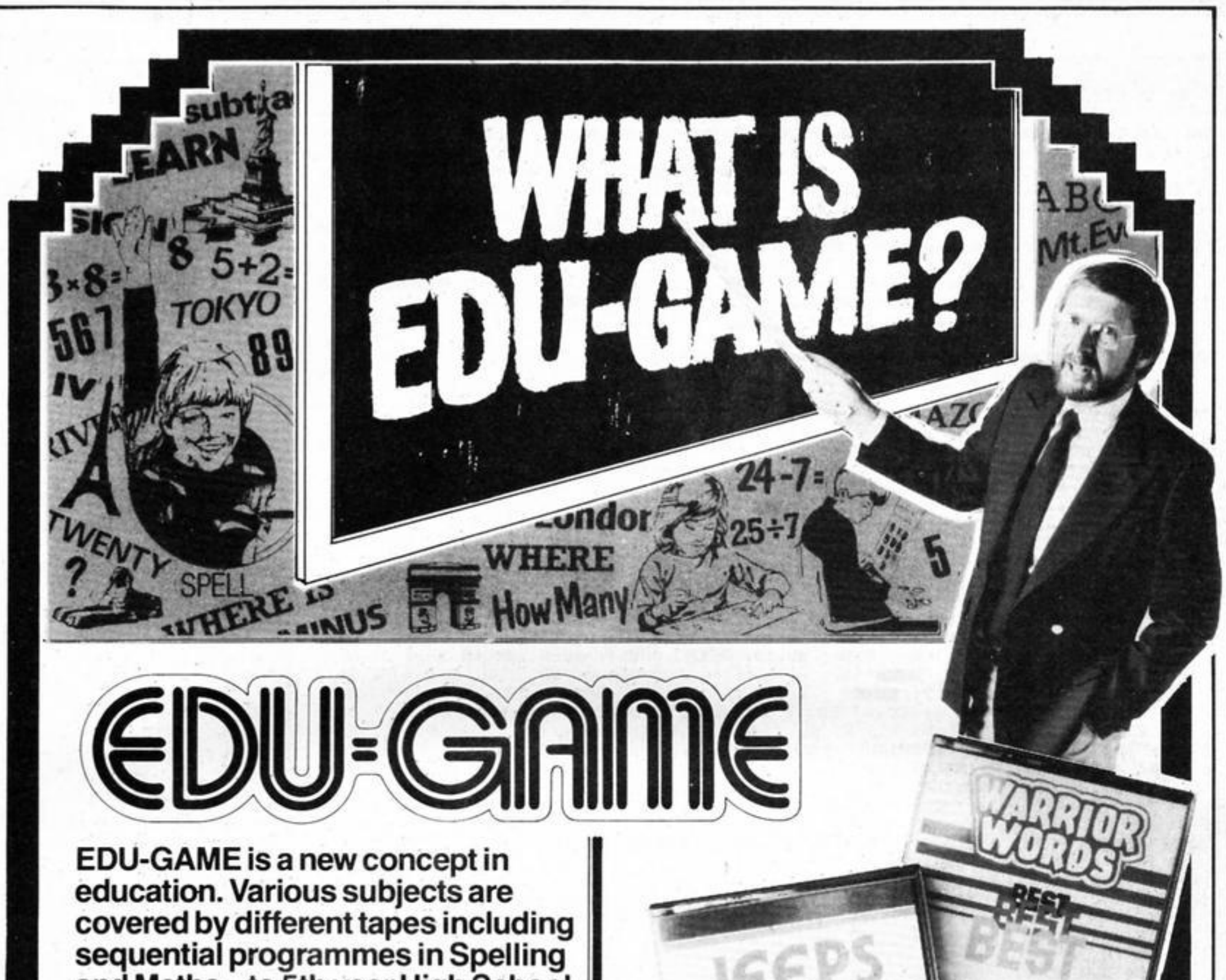
There are eight escape routes, the most obvious being through the drains. When you have collected five essentials, (e.g. compass) you can escape. However, trying to leave the prison with the wrong equipment leaves you with 30 days in the cooler. This is equivalent to a new start.

Of course it's not that easy. Occasionally an *appel* is called, and if you are caught for not appearing or you arrive with escape equipment you're in the cooler.

Two word commands are used and they can't be abbreviated: a lot of typing. **D.B.**

instructions	95%
playability	80%
graphics	50%
value for money	70%

★ ★ ★



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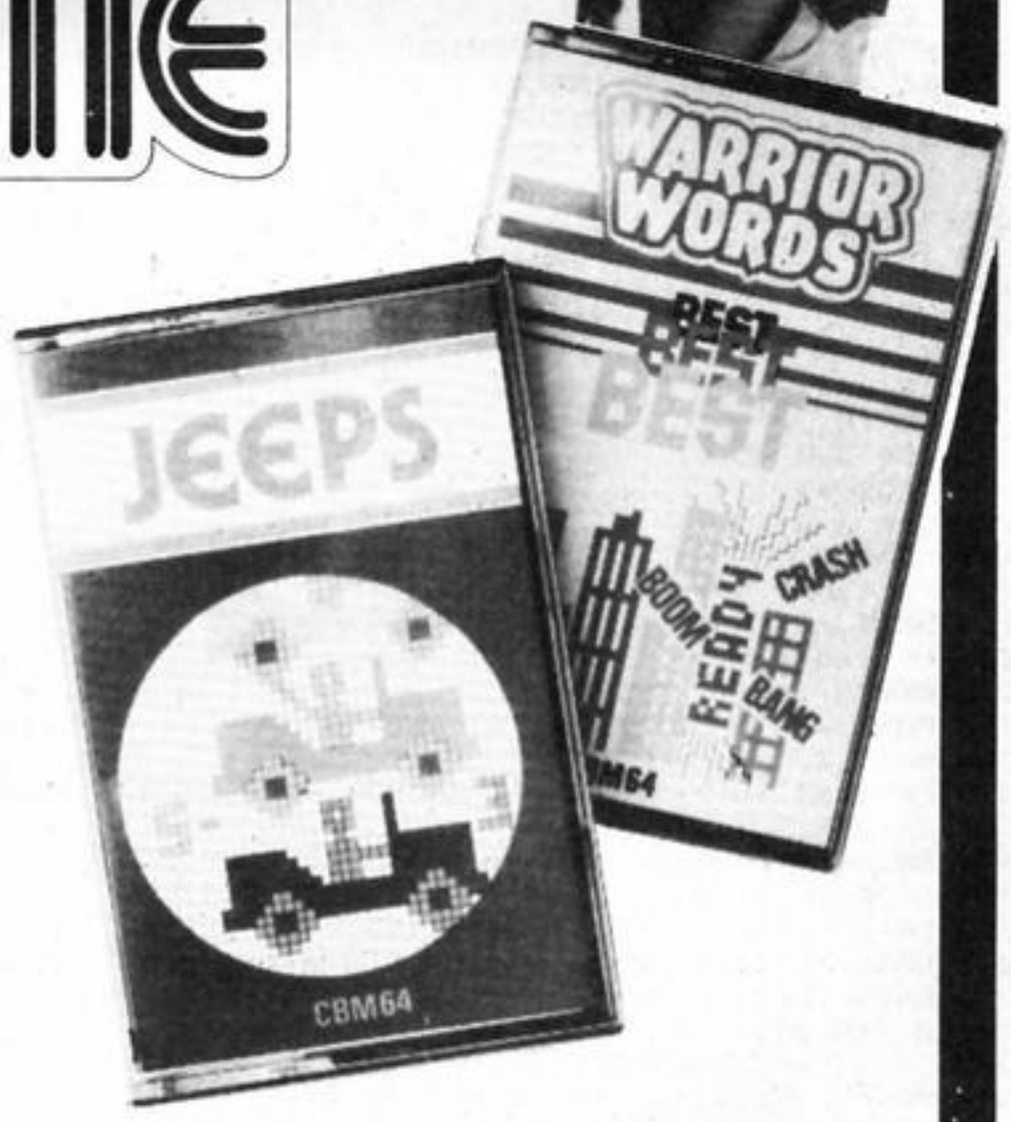

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Cut-price school offer

COMMODORE has finally come up with its answer to the government's 'micros in schools scheme' — a cut-price offer of its own.

Deliberately designed to coincide with the end of the government scheme, Commodore is offering schools and colleges throughout the UK the chance to buy Commodore 64s complete with 1541 single floppy disc drives, Logo and Simon's Basic for £299.99 per package. This is a saving of £172 over the recommended retail price of £472.

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PLEASE SEND FOR FURTHER DETAILS ON YOUR PROGRAMMES:

NAME .....

ADDRESS .....

..... P/CODE .....

Listing for Beauty and the Beast

```
   1 GO SUB 90: BRIGHT 1: INK 5: BORDER 0: PAPER 0: PRINT AT 10,5; FLASH 1;"BEAU
TY AND THE BEAST";AT 12,13; FLASH 0;"BY";AT 14,8; FLASH 0;"SAMEER SHETH": LET o=
0:
   2 PRINT AT 20,3; FLASH 1;"PRESS ANY KEY TO CONTINUE": PAUSE 0: CLS : PRINT "O
-LEFT": PRINT "P-RIGHT": PRINT "Q-UP": PRINT "A-DOWN": PRINT AT 21,3;"PRESS ANY
KEY TO START":
   3 PRINT AT 5,0;"THE OBJECT OF THE GAME IS TO    RESCUE THE PRINCESS BEFORE TH
E  HEAVY LOAD,WHICH THE BEAST HAS  DROPPED FLATENS HER."
   4 PRINT AT 10,0;"HOWEVER THIS CAN ONLY BE DONE   BY FIRST FETCHING THE ROSES.
";AT 13,0;"WATCH OUT FOR THE THORNS."
   5 PRINT AT 15,0; INK 2;"E"; INK 5;"-ROSE": PRINT : PRINT  INK 4;"S";"-THORN"
:
 PRINT : PRINT  INK 7;"Q"; INK 5;"-THORN": PAUSE 0: CLS
   6 LET t=0: INK 5: GO SUB 150
   7 LET k=0: LET l=28
   8 FOR x=0 TO 20 STEP 2: PRINT AT x,4; INK 7;"Q";AT x+1,4;"B": NEXT x:
  10 LET a=1
  20 PRINT AT a-1,0;"   "
  21 PRINT AT k,l; INK 5;"P"
  22 IF INKEY$="p" THEN  LET l=l+1: PRINT AT k,l-1;" "
  23 IF INKEY$="o" THEN  LET l=l-1: PRINT AT k,l+1;" "
  24 IF INKEY$="q" THEN  LET k=k-1: PRINT AT k+1,l;" "
  25 IF INKEY$="a" THEN  LET k=k+1: PRINT AT k-1,l;" "
  26 IF ATTR (k,l)=68 THEN  BEEP .008,20: BEEP .008,14: GO TO 400
  27 IF ATTR (k,l)=70 THEN  BEEP .08,10: BEEP .08,14: LET o=o+100: IF o>=140 THE
N  CLS : RESTORE : GO TO 6
  28 IF ATTR (k,l)=71 THEN  BEEP .08,10: BEEP .08,10: GO TO 400
  29 IF ATTR (k,l)=66 THEN  BEEP .0,10: LET t=t+1: LET o=o+10
  30 IF ATTR (a+1,1)=70 THEN  BEEP .08,10: BEEP .08,14: BEEP .08,10
  31 PRINT AT a,0; INK 7;"■■■■■"
  32 PRINT AT a+1,0; INK 7;"■■■■■"
  33 PRINT AT 19,1; INK 6;"Q";AT 20,1; INK 6;"H"
  34 LET a=a+.1
  35 PRINT AT 0,1; INK 7; BRIGHT 1;"UI"
  40 IF a>19 THEN  PRINT AT a,0;"   "
  41 IF a>19 THEN  PRINT AT a+1,0;"   ": GO TO 10
  44 IF ATTR (a,1)=70 THEN  PRINT AT a-1,0;"   ";AT a,0; INK 3;"■■■■";AT a+1,0;
I
NK 3;"■■■■■": PRINT AT 10,0; FLASH 1;"SPLAT !": GO TO 400
  50 IF t=4 THEN  GO SUB 1000
  51 IF l<0 THEN  LET l=0
  52 IF l>31 THEN  LET l=31
  53 IF k<0 THEN  LET k=0
  54 IF k>21 THEN  LET k=21
  70 GO TO 20
  90 FOR d=0 TO 8
  99 READ s$
 100 FOR z=0 TO 7
 111 READ a
 112 POKE USR s$+z,a
 114 NEXT z
 115 NEXT d
 116 REURN
 150 FOR n=0 TO 50: PRINT AT RND*20,RND*25+(+5); INK 4;"SSS"
 200 NEXT n
 210 FOR n=0 TO 3: PRINT AT RND*20,RND*20+(5); INK 2;"E": NEXT n
 300 RETURN
 400 PRINT AT 10,10; INK 7; FLASH 1;"YOUR SCORE=  ";o: STOP
 500 DATA "q",192,224,248,255,254,252,248,192
 600 DATA "a",192,192,192,192,192,192,192,192
 700 DATA "s",8,8,28,56,60,254,BIN 011111100,255
 800 DATA "h",255,BIN 00111100,BIN 00111100,255,BIN 00100100,BIN 00100100,BIN 00
100100,BIN 01100110
 900 DATA "o",8,255,62,127,93,93,BIN 10001011,42
 901 DATA "p",24,126,60,24,255,60,124,198
 904 DATA "k",15,15,31,74,54,98,80,128
 905 DATA "u",196,127,63,15,5,7,7,3
 906 DATA "i",134,252,248,192,64,192,192,128
1000 PRINT AT RND*19,4;"  ": LET t=0: BEEP .008,10: BEEP .008,14: BEEP .008,10:
BEEP .008,14: BEEP .008,10: BEEP .008,14: BEEP .008,10: BEEP .008,14: BEEP .008,
10: BEEP .008,14: BEEP .008,10: BEEP .008,14: BEEP .008,10: BEEP .008,14: BEEP .
08,10: BEEP .008,14
2000 RETURN
```

Listing for Olympic Runner

```
   1 REM  OLYMPIC RUNNER                    By A.G.Bird.1984
   2 POKE 23658,8: DIM x(64): DIM y(64)
   3 GO SUB 9000: GO SUB 8000: GO SUB 7000
   4 LET i=INT (RND*4): LET m=0: LET s=0: LET run=0: LET n=1: LET l=0
   5 LET s$="              ON  YOUR  MARKS..... GET SET..... GO!          . "
   6 BORDER 4: PAPER 7: CLS
   7REM  DRAW  GAME
   8 FOR f=5 TO 16: PRINT AT f,10; PAPER4;"                  ": NEXT f
  10 PAPER 7: INK 4: PRINT AT 0,0;"■■■■■■■■M";AT 1,0;"■■■■■■■M";AT 2,0;"■■■■■M"
;AT 3,
0;"■■■■M";AT 4,0;"■■■M";AT 5,0;"■M";AT 6,0;"M"
  12 PRINT AT 0,25;"Q■■■■■■■";AT 1,26;"Q■■■■■■";AT 2,27;"Q■■■■■";AT 3,28;"Q■
■";AT
```

Whi
your
— res
prin
win
gold

Beauty and the Beast by Sameer Sheth

You are the Prince. The Princess has been captured by a nasty beast and your task is to rescue her.

Her life is in danger. The beast has dropped a heavy weight which is descending towards her and threatens to crush her.

For the first part of your quest you must pick the roses in the garden.

Beware the sharp thorns which surround the roses and which will hurt you. Try and save the Princess before it is too late!

How it works

2-5 instructions
6-25 movement of prince and movement of heavy load
50-54 make sure prince does not go out of screen
90-115 set up of USR defined graphics
150-200 set up of thorns

Olympic Runner by Andrew Bird

What could be more appropriate in Olympic year than Olympic Runner, based on one of Britain's strongest hopes in the Games, the track events?

Cheer your favourite runner on to win the 400 metres. Skill and dexterity are vital. Fast reactions will speed your athlete on to get the gold, and set a new world record.

In the middle of the track, a key will be specified. To complete one circuit you must press the correct keys about 16 times. Meanwhile the seconds are ticking away...

See if your record times can beat the likes of Coe and Ovett. You may even qualify for the 1988 Olympics!

ch is arget uing a ess or edal?

Decide on your mission and then strive to complete it with your Spectrum. Defeat all obstacles to rescue a maiden in distress or go for gold and set a new world track record

How it works

2-6 set cursor to upper case, define variables
8-60 draw game, prepare player
100-300 main loop. Sets up random letter to be pressed, checks if pressed, if so advances runner, keeps time
1000 random letter subroutine
5000-5030 end of game sub-routine
7000-7100 set up array for runner position
8000-8050 instructions
9000-9100 graphics

Variables

x,y array co-ordinates
i colour of runner
m minutes
s seconds
n defines which part of array
l check for letter set up
run spaces to run
letter actual letter to be pressed
a$,b$,c$ runner
s$ countdown to race

• When typing in these programs, underlined characters should be entered in GRAPHICS mode.

```
4,29;"Q■■■";AT 5,30;"Q■";AT 6,31;"Q"
  14 PRINT AT 15,0;"N";AT 16,0;"■N";AT 17,0;"■■■N";AT 18,0;"■■■■N";AT 19,0;"■■■
■■N"
;AT 20,0;"■■■■■■■N";AT 21,0;"■■■■■■■■N"
  16 PRINT AT 15,31;"P";AT 16,30;"P■";AT 17,29;"P■■■";AT 18,28;"P■■■■";AT 19,2
7;"P
■■■■■■";AT 20,26;"P■■■■■■■";AT 21,25;"P■■■■■■■■■"
  20 PRINT AT 5,9;"P";AT 6,8;"P■";AT 7,7;"P■■■";AT 8,6;"P■■■■";AT 9,5;"P■■■■■■"
;AT 1
0,5;"■■■■■■■■"
  22 PRINT AT 11,5;"■■■■■■■";AT 12,5;"Q■■■■■■";AT 13,6;"Q■■■■■";AT 14,7;"Q■■■";AT
 15,8;
"Q■";AT 16,9;"Q"
  24 PRINT AT 5,22;"N";AT 6,22;"■N";AT 7,22;"■■■N";AT 8,22;"■■■■N";AT 9,22;"■■■
■■N"
;AT 10,22;"■■■■■■■"
  26 PRINT AT 11,22;"■■■■■■■";AT 12,22;"■■■■■M";AT 13,22;"■■■■M";AT 14,22;"■■M
";AT 1 .
5,22;"■M";AT 16,22;"M"
  30 PRINT AT 15,10; INK 0; PAPER 6;"OLYMPIC  RUN"
  35 INK 0: CIRCLE 104,100,10: CIRCLE 128,100,10: CIRCLE 152,100,10: CIRCLE 116,
90,10: CIRCLE 140,90,10
  40 PAUSE 50
  45 PRINT AT 13,10; PAPER 7;"           "
  50 FOR f=1 TO LEN s$-11: PRINT AT 13,10;s$(f TO f+11): BEEP .05,-20: NEXT f
  55 PRINT AT 13,10; PAPER 7;"           "
  60 BEEP .5,40
  9 REM  MAIN  LOOP
 100 IF l=0 THEN  GO SUB 1000
 120 IF PEEK 23560=letter THEN  LET run=run+3: LET l=0
 140 IF run=0 THEN  GO TO 160
 150 LET n=n+1: LET run=run-1
 155 IF n=65 THEN  GO TO 5000
 160 IF n>0 THEN  LET a$=" CD ": LET b$=" GH ": LET c$=" KL "
 165 IF n>13 THEN  LET a$=" AB ": LET b$=" EF ": LET c$=" IJ "
 170 IF n>45 THEN  LET a$=" CD ": LET b$=" GH ": LET c$=" KL "
 200 PAPER 7: INK i: PRINT AT x(n),y(n);a$;AT x(n)+1,y(n);b$
 205 PRINT AT x(n)-1,y(n);"    ";AT x(n)+2,y(n);"    "
 210 BEEP .05,(n/3)-10
 220 PRINT AT x(n),y(n);a$;AT x(n)+1,y(n);c$
 230 BEEP .05,(n/2)-10
 240 LET s=s+.39
 245 IF s>60 THEN  LET m=m+1: PRINT AT 13,17;m;AT 13,18;".";AT 13,20;" ": LET s=
0
 250 PRINT AT 13,11;"TIME"
 255 IF INT s<10 THEN  PRINT AT 13,19;"0";INT s
 260 IF INT s>=10 THEN  PRINT AT 13,19;INT s
 300 GO TO 100
 999 REM  LETTER
1000 LET letter=INT (RND*26)+65: PRINT AT 6,10; INK 0; PAPER 5;"  Press  ";CHR$
letter;"  ": LET l=1: RETURN
4999 REM  END OF GAME
5000 FOR f=1 TO 100: BEEP .01,f/4: BORDER 7: BORDER 6: BORDER 4: NEXT f
5010 PAPER 6: INK 0: CLS : PRINT AT 8,6;"YOU  HAVE  JUST  RUN";AT 10,8;"400  MET
RES  IN"
5015 IF m=0 THEN  GO TO 5025
5020 PRINT AT 14,7;m;" MIN. ";INT s;" SECONDS": GO TO 5030
5025 PRINT AT 14,10;INT s;" SECONDS"
5030 PAUSE 50: PRINT AT 21,1;"PRESS ANY KEY FOR ANOTHER RACE.": PAUSE 0: GO TO 4
6999 REM  SET UP ARRAY
7000 FOR f=1 TO 9: LET x(f)=18: NEXT f
7010 FOR f=10 TO 24: LET x(f)=27-f: NEXT f
7020 FOR f=25 TO 41: LET x(f)=2: NEXT f
7030 FOR f=42 TO 56: LET x(f)=f-39: NEXT f
7040 FOR f=57 TO 64: LET x(f)=18: NEXT f
7050 FOR f=1 TO 13: LET y(f)=13+f: NEXT f
7060 FOR f=14 TO 20: LET y(f)=27: NEXT f
7070 FOR f=21 TO 45: LET y(f)=47-f: NEXT f
7080 FOR f=46 TO 52: LET y(f)=1: NEXT f
7090 FOR f=53 TO 64: LET y(f)=f-51: NEXT f
7100 RETURN
7999 REM  INSTRUCTIONS
8000 CLS : PRINT AT 0,0; PAPER 1; INK 6;"          OLYMPIC  RUNNER.          "
8010 PRINT AT 2,10; INK 3;"By A.G.Bird"
8020 INK 1: PRINT AT 4,0;"HAVE  YOU  EVER  DREAMED  THAT"''"YOU  WOULD  TAKE  PA
RT  IN  THE"''"        OLYMPIC  GAMES ?"
8025 PRINT AT 10,2; INK 2;"WELL NOW  IS  YOUR  CHANCE."
8030 PRINT AT 13,0;"Use your skill & quick reaction"''"time to press the correct
 keys"''"and you will be sprinting around"''"the 400 metres circuit in the"''"
    Olympic  Stadium."
800 PAUSE 500: RETURN
8999 REM  GRAPHICS
9000 FOR f=65368 TO 65495: READ a: POKE f,a: NEXT f
9010 DATA 12,30,12,4,15,22,23,99,0,0,0,0,192,32,32,0
9020 DATA 0,0,0,0,3,4,4,0,48,120,48,32,240,104,232,198
9030 DATA 3,3,2,3,2,2,2,6,128,128,128,0,128,64,64,0
9040 DATA 1,1,1,0,1,2,2,0,192,192,64,192,64,64,64,96
9050 DATA 3,15,16,32,192,0,0,0,128,128,128,140,112,0,0,0
9060 DATA 1,1,1,49,14,0,0,0,192,240,8,4,3,0,0,0
9070 DATA 255,254,252,248,240,224,192,128,128,192,224,240,248,252,254,255
9080 DATA 255,127,63,31,15,7,3,1,1,3,7,15,31,63,127,255
9100 RETURN
```

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MASTERCLASS video tapes to win

EVERYONE stands to gain in this free competition from Home Computing Weekly and Masterclass.

We're giving away 30 video tapes on computing with the Spectrum, VIC-20, BBC, Electron and Commodore 64.

But even if you're not among the winners you still get a bonus. Masterclass will send every entrant a 10 per cent discount voucher for any of its computer video tapes ordered by mail.

Each tape costs £19.95, so the discount offer is worth nearly £2.

Masterclass takes a new angle on learning. First you watch the video tutorial then you transfer the programs from it to your computer. Now you can play the games and study how they work.

The range of Masterclass tapes includes BASIC, programming, graphics and games and education.

The graphics and games video tapes, for the BBC and Electron, give you the chance to use your imagination and create new games from the knowledge you have gained. Playing and learning will be so intermingled that you won't know the difference!

For those of you who are teachers, there is a Masterclass video tape to show how the BBC computer can be used to best effect in the primary classroom.

David Redclift is the presenter on both the BBC BASIC video tapes and the primary education one. Mr Redcliffe has worked with computers since 1965, which makes him an old hand. He has been involved with the training of programmers for the past 12 years, so he really knows what he is talking about! His video-based courses on PL/1 and COBOL are now in world-wide use.

Masterclass 10 per cent discount vouchers will only be accepted as part of a mail order sent directly to Masterclass.

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Programming Level 2

VIC-20
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Programming Level 2

How to enter

Examine the two cartoons carefully — there are several differences between them.

Circle the differences on cartoon B and then fill in your name, address, the number of differences you found and the computer you own — BBC, Electron, Spectrum, Commodore 64 or VIC-20 — and your video recorder format, VHS or Beta.

Seal the coupon and cartoon B in an envelope and write clearly on the back of the envelope the number of differences you found.

Post your entry to Masterclass Competition, Home Computing Weekly, No. 1 Golden Square, London W1R 3AB.

Entries close at first post on Friday June 8, 1984. The winners will be the first 30 entries opened at random, regardless of computer. All contestants will receive a voucher entitling them to a 10 per cent discount off a Masterclass video tape ordered directly from Masterclass.

You may enter as many times as you wish, but each entry must be on the oficial coupon and cartoon — not a copy — and sealed in a separate envelope.

The prizes will arrive from Masterclass within 28 days of the publication of the issue containing the names of the winners.

Important: please follow carefully the guidelines for entering — incomplete coupons and entries in envelopes with no number on the back cannot be considered. If you are a winner, the coupon will be used as a label to send your prize so clear writing is essential.

Masterclass Competition

Entry Coupon

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_____

_____

_____ **post code** _____

Number of differences found _____

Computer _____

VHS/Beta (delete inapplicable format

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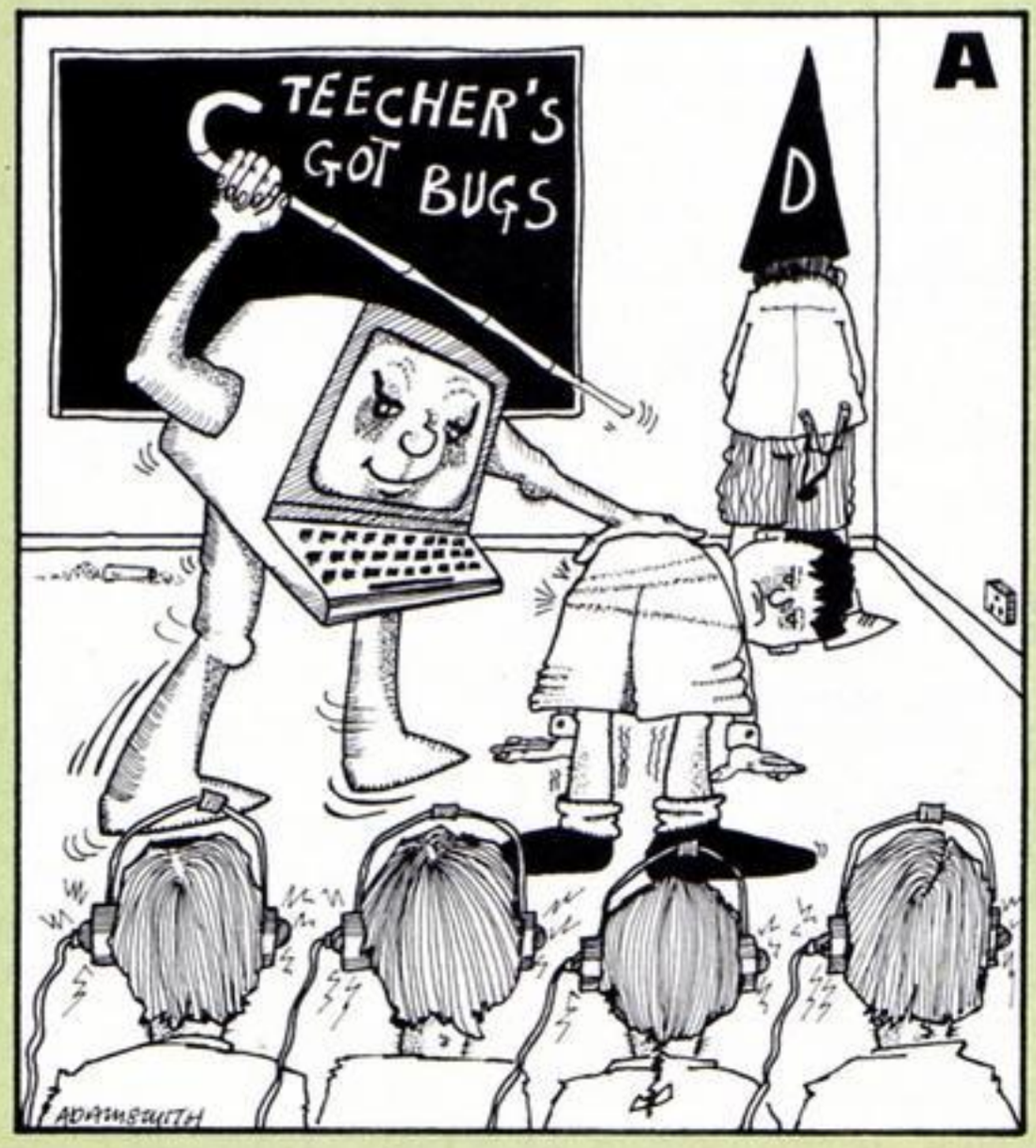

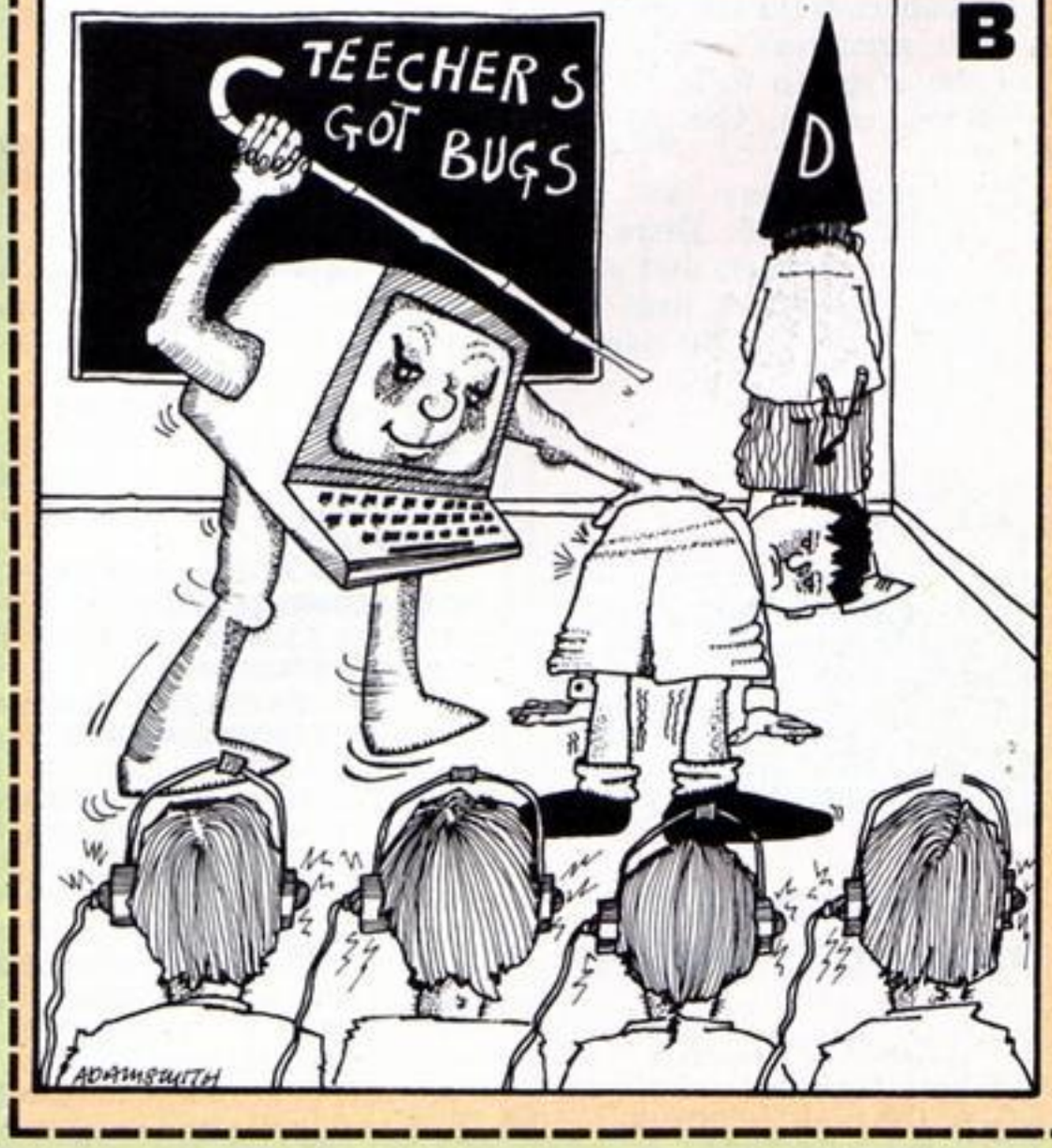

Defend planet... learn to

Two great VIC-20 programs to type in and play. One is for the unexpanded computer and the second needs an extra 3K of RAM

Galaxy by Chris Pettit and Nic Brereton

Many moons ago a party of earthlings left their war-torn planet to search for a new home far across the universe.

The survivors of this danger-prone trip landed on a seemingly uninhabited planet to establish a new civilisation. But Planos was far from peaceful, as they found out when an evil space fleet began a bombardment.

How it works
0-10 define characters
11-18 introduction
19-22 set up variables
90-96 set up game values
105 input routine
110-150 check movement and collision of first swooper
190-250 as above for second swooper
300-430 move your blaster
400 check fire button (SHIFT key)
500-600, 605-650 firing routine for first, second swooper
700 output score
2000-2002 hit a swooper routine
3000 sound effects
4000-5000 you are hit
5000-5010 adjust lives routine
6000-6050 end game routine

The terrified citizens managed to save one ground-based blaster from the remains of their armaments store and they chose you to fight off the mysterious enemy. Can you do it?

The game runs on the unexpanded VIC-20. There are two types of invaders and your score and number of lives left are displayed in the top right.

Use these keys:

Z left
X right
SHIFT fire

Main variables
LI number of lives
S your position
I1,I2 positions of two swoopers
P stops screen scrolling
X counter

Pilot 20 by Graham Wells

My program runs on the 3K expanded VIC-20 and simulates the flight of a light aircraft.

I have tried to make it as authentic as possible. Your controls are:

less than key	revs up
greater than key	revs down
up arrow	nose up (climb)
***(asterisk)**	nose down (dive)

Listing for Galaxy

```
0 POKE36878,15:POKE56,28:POKE52,28
1 FORX=1TO512:POKE7167+X,PEEK(32767+X):NEXT
2 FORX=1TO64:READJ:POKE7167+X,J:NEXT
3 DATA0,16,16,124,254,254,146,16
4 DATA0,20,28,107,93,85,0,0
5 DATA16,84,124,84,16,186,254,146
6 DATA0,16,16,0,0,16,16,0
7 DATA0,0,0,0,16,16,16,0
8 DATA0,108,146,170,84,170,146,108
9 DATA1,1,1,1,1,1,1,1
10 DATA128,128,128,128,128,128,128,128
11 LI=3:POKE808,127
12 POKE36869,240
13 CT=30720:POKE36879,25
14 PRINT"■■■
```

your and fly

left square bracket	bank left
right square bracket	bank right
G	gear up
H	gear down
F	flaps (lower)
D	flaps (raise)
M	map display

These are meanings of the flight deck display:

VSI vertical speed indicator — by how much your aircraft climbs in a second
ASI air speed indicator
ALT altitude — height above sea level
HEAD your compass heading
DME distance from beacon
BRG your bearing relative to the beacon. When starting on runway, heading is 360, BRG is 180. If you look on the map you will see that the beacon is directly behind the runway and so behind you, a compass bearing of 180 (south).

Stall speed is 60 ASI, the undercarriage is damaged above 150 ASI and ceiling is 3,000.

I hope you enjoy playing it. One improvement would be to add some sound effects.

How it works

1-5 initialisation, GOSUB for introduction
10-20 variables for take-off
100-260 display instruments
270-290 controls from keyboard
300-340 change variables
345-347 print scenery
355-390 POKE artificial horizon
420-490 change speed, altitude etc
500-1000 check for crash, stall etc
1000-1180, 1200-1290 bank left, bank right
1500-1540 print why you crashed
3000-3050 landing lights before runway
3900-3110 runway lights
3200-3320 print mast lights, check for crash into masts
4000-4150 print map
4500-4670 introduction
4680-4690 variables for in flight
5000-6080 crash routine, play again?

As usual, we have inserted REMs in the lines above to control characters as a guide when you are typing in the programs. These REMs should not be entered.

```
465 IFPEEK(P)=1ORPEEK(P)=0THEN4000
470 POKEP,3
480 NEXT
500 IFB1=0THEN600
505 FORDF=1TO2
510 POKEP1,32:P1=P1+22
515 IFPEEK(P1)=2THEN5000
520 IFP1>8185THENB1=0
525 POKEP1,4
550 NEXT
600 IFB2=0THEN700
605 FORDF=1TO2
610 POKEP2,32:P2=P2+22
615 IFPEEK(P2)=2THEN5000
620 IFP2>8185THENB2=0
625 POKEP2,4
650 NEXT
690 REM[HOME][HOME]
700 PRINT"■"SC"■"
1999 GOTO107
2000 T=0:FORX=7810TO7702STEP-1:IFPEEK(X)<>32THENT=X:C=PEEK(X):X=7702:POKET,32
2002 NEXT:RETURN
3000 FORZ=240TO190STEP-2:POKE36876,Z:NEXT:POKE36876,0:RETURN
4000 IFPEEK(P)=1THENSC=SC+10:GK=GK+1:IFP=G1ORP=G2THENSC=SC+90
4005 B=0
4010 IFPEEK(P)=0THENSC=SC+50:GK=GK+1:IFP=G1ORP=G2THENSC=SC+450
4020 POKEP,5
4030 GOSUB3000
4040 IFP=G1THENGOSUB2000:G1=T:C1=C
4050 IFP=G2THENGOSUB2000:G2=T:C2=C
4055 IFGK=19THEN20
4060 GOTO1999
5000 LI=LI-1:IFLI=0THEN6000
5005 POKES,5:FORX=1TO50:POKE36877,177-X:NEXT
5007 IFPEEK(203)=64THEN5007
5010 POKE7697+LI,32:GOTO1999
6000 POKES,5:POKES+CT,7:FORX=255TO127STEP-1:POKE36877,X:NEXT
6001 REM[CLR][3 CRSR DOWN][WHT][2 CRSR DOWN][CRSR DOWN]
6005 POKE36869,240:PRINT"■■■
```

```
 266 REM CONTROLS
 270 GETA$:IFA$=""THEN290
 271 IFA$="G"THENU$="■ UP ":REM[RED]
 272 IFA$="H"THENU$="■DOWN":REM[GRN]
 273 IFA$="."THENR=R+600:IFR>3600THENR=3600
 274 IFA$=","THENR=R-600:IFR<0THENR=0
 275 IFA$=":"THENU=1:GOTO1000
 276 IFA$=";"THENU=-1:GOTO1000
 277 IFA$="↑"THENQ=-1:V=V+1
 278 IFA$="*"THENQ=1:V=V-1
 279 IFA$="F"THENFL=FL+1:IFFL>5THENFL=5
 280 IFA$="D"THENFL=FL-1:IFFL<0THENFL=0
 285 IFA$="M"THENGOSUB4000
 288 REM MAIN LOOP
 290 IFS>60THENS$="■■■":REM[GRN]
 295 IFS<60THENS$="■■■":REM[RED]
 298 REM[HOME][WHT]
 300 IFA<=0ANDD>10.9ANDD<11.5THENPRINT"■■RUNWAY OVERSHOOT":GOTO1540
 305 IFA<=0ANDD<9.9ORD>11ANDA<0THENA=0:GOSUB1500
 309 REM[HOME][WHT]
 310 IFS<60ANDA>0THENS=0:PRINT"■■ STALLED !":GOTO1540
 320 POKE7680+7+(22*13)+(22*Q),32
 330 IFV>5THENQ=1:M=67
 335 IFV<-5THENQ=-1:M=67
 336 IFV<5ANDV>-5THENQ=0
 340 IFU<>0THENGOTO360
 341 REM SCENERY
 344 REM[HOME]
 345 PRINT"■":FORT=0TOINT(A)/500:PRINT"                                        ";:NEXTT
 346 PRINT"■■";MID$(M$,INT(B),22);
 347 IFA<500RA>3500THENFORT=1TO7-INT(A)/500:PRINT"                                        ";:NEXTT
:GOTO360
 350 FORT=1TO7-INT(A)/500:Y=INT(RND(1)*10):PRINT"■■";MID$(M$,INT(B+T)+Y,22);:NEXT
T
 355 REM ARTIFICIAL HORIZON
 360 IFU=0THENM=67
 365 IFU<0THENM=78
 370 IFU>0THENM=77
 380 POKE7680+7+(22*13)+(22*Q),M:POKE38400+7+(22*13)+(22*Q),7:U=0
 385 REM[HOME][WHT]
 390 IFA>3500THENA=3500:PRINT"■■ CEILING !"
 420 A=A+V:S=S+R/1000
 421 REM CHANGE SPEED/ALTITUDE ETC.
 422 IFS>R/1000THENS=S-2
 425 IFS<R/1000THENS=S+1
 430 S=S-FL*2:F=F-R/100000
 441 IFH<360ANDH>270THENBRG=BRG-1+D/10:B=B-.1:IFB<1THENB=61
 442 IFH<270ANDH>180THENBRG=BRG+1-D/10:B=B+.1:IFB>61THENB=1
 443 IFH>0ANDH<90THENBRG=BRG+1-D/10:B=B+.1:IFB>61THENB=1
 444 IFH<180ANDH>90THENBRG=BRG-1+D/10:B=B-.1:IFB<1THENB=61
 445 IFS<=0THEN550
 450 IFH>270ORH<90THEND=D+.01:GOTO470
 460 IFH<270ORH>90THEND=D-.01
 470 IFD<=11ANDD=>10ANDH=360ANDBRG>179.9ANDBRG<181ANDU=0THENGOSUB3000
 480 IFD<=10ANDD=>9.8ANDH=360ANDBRG>179.9ANDBRG<181ANDU=0THENGOSUB3095
 485 REM[RED]
 490 IFA<1ANDU$="■ UP "THENGOTO1500
 550 IFBRG>89.9ANDBRG<91ANDD>3ANDD<3.5THENGOSUB3200
 560 IFBRG>269.9ANDBRG>271ANDD>1ANDD<1.5THENGOSUB3300
 565 REM[HOME][WHT]
 570 IFF=<0THENPRINT"■■OUT OF FUEL":GOTO1540
 575 REM[GRN][HOME][WHT]
 580 IFS>150ANDU$="■DOWN"THENPRINT"■■ GEAR DAMAGED":GOTO1540
 590 PRINT"■                "
 600 IFD>12ANDBRG>140ANDBRG<210ANDA<50THENPRINT"■■CHRASH INTO BUILDING":GOTO1540
 950 GOTO100
1000 IFU=1THENH=H-1
1010 IFU=-1THENH=H+1
1060 IFH<0THENH=360
1070 IFH>360THENH=0
1075 REM[HOME][WHT]
1080 IFA<30THENPRINT"■■TURN TOO LOW":GOTO1540
1089 REM BANK RIGHT
1090 IFU<>1THENGOTO1200
1095 REM[HOME][CRSR UP][GRN]
1100 PRINT"■■■                 ";
1110 PRINT"                  ";
1120 PRINT"                  ";
1130 PRINT"                  ";
1140 PRINT"                  ";
1150 PRINT"                  ";
1160 PRINT"                  ";
1170 PRINT"                    ";
1180 GOTO290
1190 REM BANK RIGHT
1200 IFU<>-1THENGOTO290
1205 REM[HOME][CRSR UP][GRN]
1210 PRINT"■■■                       ";
1220 PRINT"                  ";
1230 PRINT"                  ";
1240 PRINT"                  ";
1250 PRINT"                  ";
1260 PRINT"                  ";
1270 PRINT"                  ";
1280 PRINT"                  ";
1290 GOTO290
1500 IFD<100RD>11ANDBRG>180.90RBRG<179.9THENPRINT"■■CRASHED INTO
GROUND":GOTO15 40
1505 REM[GRN]
1510 IFU$="■DOWN"THEN1530
1515 REM[HOME][WHT]
1520 PRINT"■■UNDER CART UP":GOTO1540
1525 REM[HOME][WHT]
1530 PRINT"■■DOWN : SAFE LANDING":FORT=1TO4000:NEXTT:PRINT"■
":GOTO4500
1535 REM[HOME]
1540 FORT=1TO2000:NEXTT:PRINT"■                              ":GOTO5000
3000 IFD>=10.8THENK=2
3005 IFA>49THENGOTO3050
3010 REM LANDING LIGHTS
3012 REM[HOME][3 CRSR DOWN][WHT]
3015 PRINT"■■■■■          :.:       ";
3020 PRINT"             : . :      ";
3025 PRINT"            :  .  :     ";
3030 PRINT"           :   .   :    ";
3035 PRINT"          :    .    :   ";
3040 IFD>10.9THENPOKE36876,255
3050 RETURN
3090 REM RUNWAY LIGHTS
3095 IFA>49THENRETURN
3098 REM[HOME][3 CRSR DOWN][WHT][GRN][WHT][GRN][WHT]
3100 PRINT"■■■■           ■■.■:■■.■      ";
3101 PRINT"                 :      ";
3102 PRINT"               ■■..■:■■..■     ";
3103 PRINT"                 :      ";
3104 PRINT"             ■■....■:■■....■   ";
3105 PRINT"                 :      ";
3110 RETURN
3190 REM MAST LIGHTS
3195 REM[HOME][5 CRSR DOWN][10 CRSR RIGHT][WHT]
```

```
3200 PRINT"■■■
```

Bridge Master Dragon 32 £29.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot, Wales SA13 2PE

I am not a bridge buff. I know only a little about the game so when Bridge Master dropped through my door, I thought this might be my chance to learn the grand game of bridge. This expensive package includes a cartridge, a cassette containing 100 different hands (more complex hands will be available on cassette, we are told) and two quite extensive manuals, one detailing the game and the other how the cartridge works. All this is extremely well packaged but what of the content?

The program is designed for the beginner or less experienced player. The tutor takes you through the basics of the game and on to the more complex stages. The package is far too extensive to detail, but uses excellent graphics for the four hands, has many helpful features for the novice and numerous little touches that add fun and realism. The acid test was to place a proper bridge player down in front of the computer; I did so and had to drag him away when I wanted to go home. This is a winner. **C.G.**

instructions	90%
playability	90%
graphics	95%
value for money	80%

★ ★ ★ ★ ★

If I had a Million Dragon 32 £9.99

Phoenix, Spangles House, 116 Marsh Rd, Pinner, Middx

This is not the usual one-game package but two linked games, one of which must be successfully completed in order to move to the next one. Phoenix describes them as action and adventure games, but don't be misled by this; they are not arcade action and text type adventure! Rather the first game is faster moving than the second and has the added interest of being for more than one player, should you so wish.

The first is actually very like a famous property speculation board game but instead of having the full board on display you see only the square you land on. The aim of this game is to get £20,000 so that the powers that be lend you a million for the next game. Having got your codes, and by now only the winner of game one is playing, you try to turn your million into five million by stock trading and other investments. The program has the facility to check your mail for good or bad news. Overall an involving package good on fun but low on originality. **D.C.**

instructions	90%
playability	80%
graphics	50%
value for money	80%

★ ★ ★ ★

Lunar Rover Patrol Dragon £10.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot, West Glam SA13 2PE

Drive your lunar buggy across the surface of the moon avoiding or destroying a number of obstacles, including boulders, craters and spaceships.

Movement is controlled by the joystick. Moving left or right controls speed while upwards enables the buggy to jump over craters. The fire button activates horizontal and vertical lasers. As there are only four main actions I am surprised there is no facility to use keys.

Points are given for jumping or shooting obstacles. A bonus is awarded according to speed of progress.

Your current score and the highest score are displayed on screen, as is the number of buggies left. When your buggy is destroyed you re-start from the last point successfully passed.

The screen display varies considerably as you progress. I especially liked the way the buggy fell to pieces when it was hit.

Loading gave no problems and the instructions included are clear.

Not the sort of game to which I would become addicted, but certainly very enjoyable. **J.E.M.**

instructions	75%
playability	75%
graphics	80%
value for money	70%

★ ★ ★

Pit your wits against these!

New software for the Dragon is assessed by our reviewers

Junior's Revenge Dragon 32 £10.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot, Wales SA13 2PE

Microdeal's Donkey King (renamed The King) has been one of the biggest selling Dragon games. This is the long-awaited sequel to the masterful original and something I could not wait to get my hands on. You are the son of the gorilla that was captured in the first game and must try to rescue your dad from the evil clutches of Luigi. This entails jumping across vines, scampering up and down them and avoiding obstacles and unfriendly beasts sent by Luigi to trap you. As in the original game, once you reach the top of the screen you are taken to a different screen. There are four screens involving trampolines, conveyor belts and all the obstacles you would expect from this type of game.

There is a choice of one of the two-colour screens or the higher resolution black and white screen. The title page, demonstration mode and high score table are all up to the usual high standard but I cannot help feeling that this game is not as good as the original. This is far too expensive for an arcade game. **C.G.**

instructions	55%
playability	75%
graphics	75%
value for money	30%

★ ★

El Bandito Dragon £7.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot, West Glam SA13 2PE

The unlikely hero of this amusing game is an ant who scurries around a maze stealing fruit while being hunted by spiders. The ant walks up to the fruit and disappears. You can then move the fruit slowly back to your lair. If the spider is in hot pursuit you can drop the fruit and escape more quickly. The spider cannot get you in your lair.

There are eight skill levels and playing areas which control the number of spiders and complexity of the maze.

Two people can play, and then not only must you avoid spiders but also try and grab the fruit before your opponent does.

You begin each game with three lives but it is possible to gain more. Score for each player and the highest score are displayed.

Screen display is excellent. I particularly liked the marauding spiders. I had no problems loading the game and the instructions are sufficient.

Playing this gave me a lot of laughs and I shall certainly be playing many more times. **J.E.M.**

instructions	70%
playability	85%
graphics	90%
value for money	85%

★ ★ ★ ★

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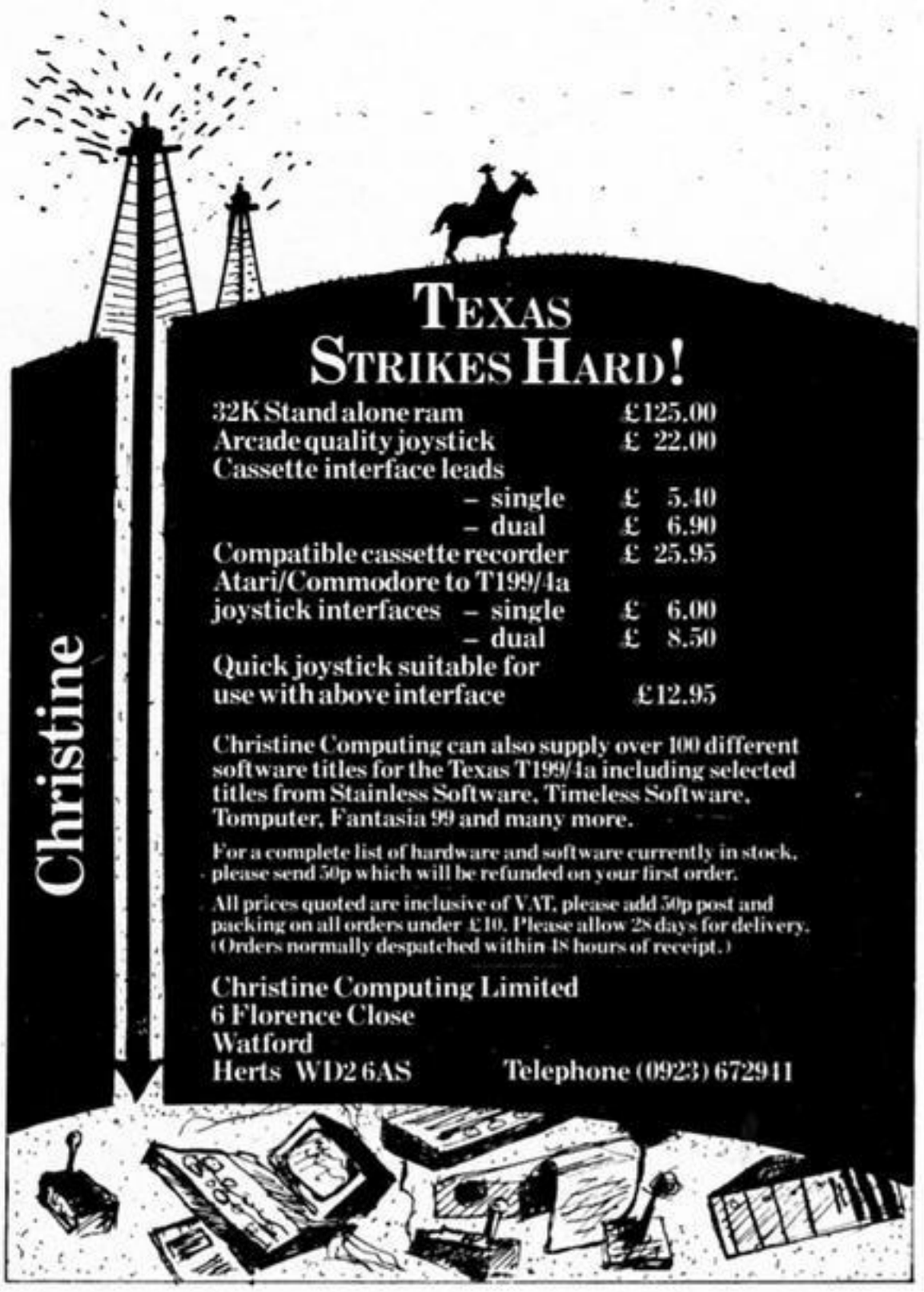

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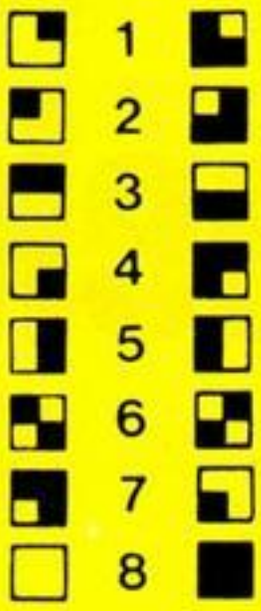
PIXEL~PAD
for ZX-SPECTRUM

Programming Information

Colours

0. Black
1. Blue
2. Red
3. Magenta
4. Green
5. Cyan
6. Yellow
7. White
8. No Change
9. Contrast

Graphics Characters



Colour Control

INK n : n = Colour (0 to 9)
PAPER n : n = Colour (0 to 9)
FLASH n : n = 0 Steady, 1 Flashing, 8 No Change
BRIGHT n : n = 0 Normal, 1 Bright , 8 No Change
INVERSE n : n = 0 Normal (Ink on Paper)
n = 1 Inverse (Paper on Ink)
OVER n : n = 0 New character obliterates old one
n = 1 New and old characters combine to give ink colour where either (not both) were ink, otherwise paper colour
BORDER n : n = Colour (0 to 7)
ATTR(l,c) : Function returning attributes of the character at line l, column c
Bit: 7 is 1 for Flashing; 6 is 1 for Bright
5,4,3 – Paper Colour
2,1,0 – Ink Colour

Graphics Commands

PLOT c;x,y : Ink in pixel x,y
DRAW c;x,y,Θ: Draw line x,y pixels long (relative) while turning Θ radians (Optional)
CIRCLE c;x,y,r: Draw circle centred at pixel x,y with radius r pixels
(Note: c is any local colour controls required)
POINT (x,y) : Function which returns:-
0 if pixel x,y is paper colour
1 if it is ink colour

Character Commands

PRINT item, item... A print item can be one of
- Null
- Numeric expression
- String expression
- **AT l,c**: moves cursor to line l, column c
- **TAB c**: moves cursor to column c, same line
- Colour control command

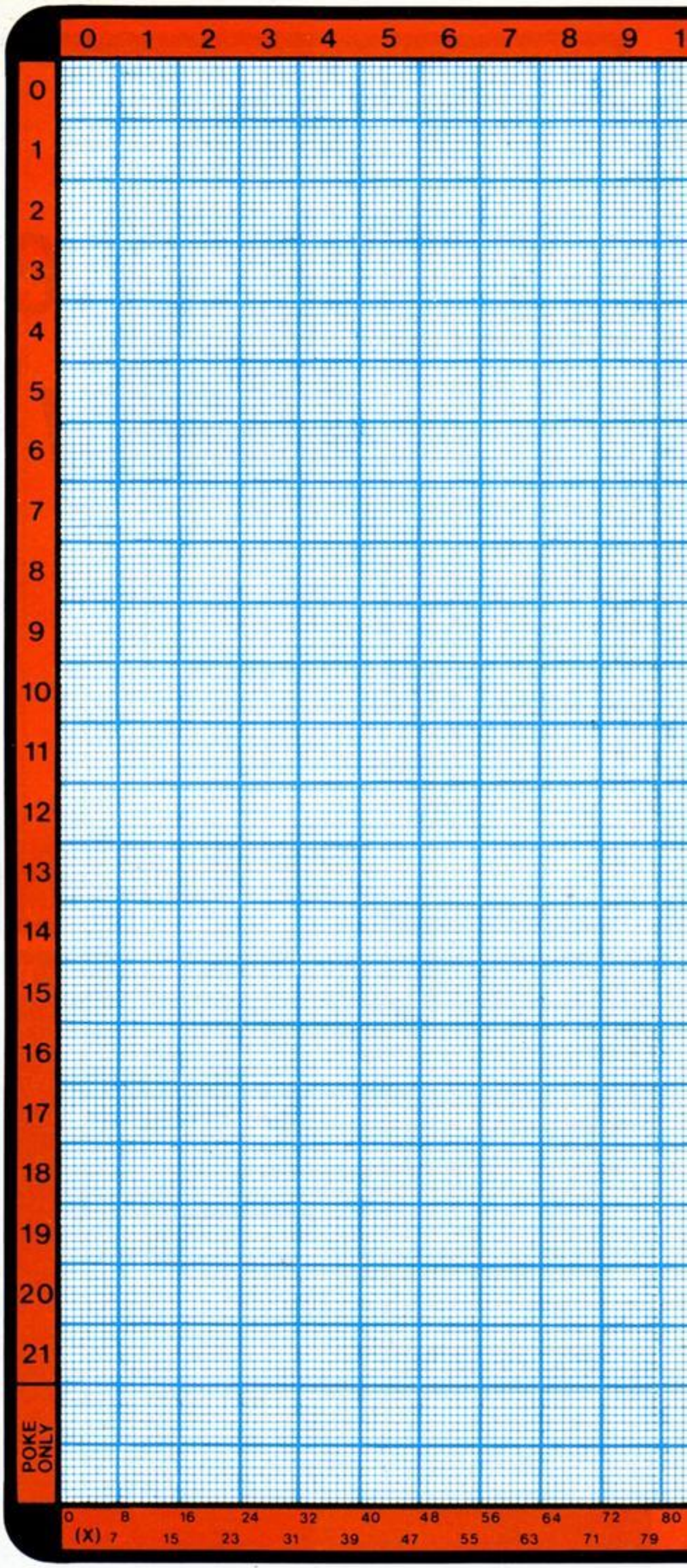
Items can be seperated by
- a comma, next item at next half line
- a semi-colon; next item follows immediately
- an apostrophe' next item on new line

POKE a,n : Writes the value n to address a
PEEK a : Function which returns the value at address a
USR "a" : Function which returns the start address of character a
SCREEN$(l,c): Function which returns the character at line l, column c
BIN n : Indicates n is a binary number

User Defined Graphics

POKE USR "a"+x, BIN n: will write the binary number n to the x th row of the bit pattern for character a

Computer Agencies Limited
28 Sun Street, Hitchin, HERTS SG5 1AT



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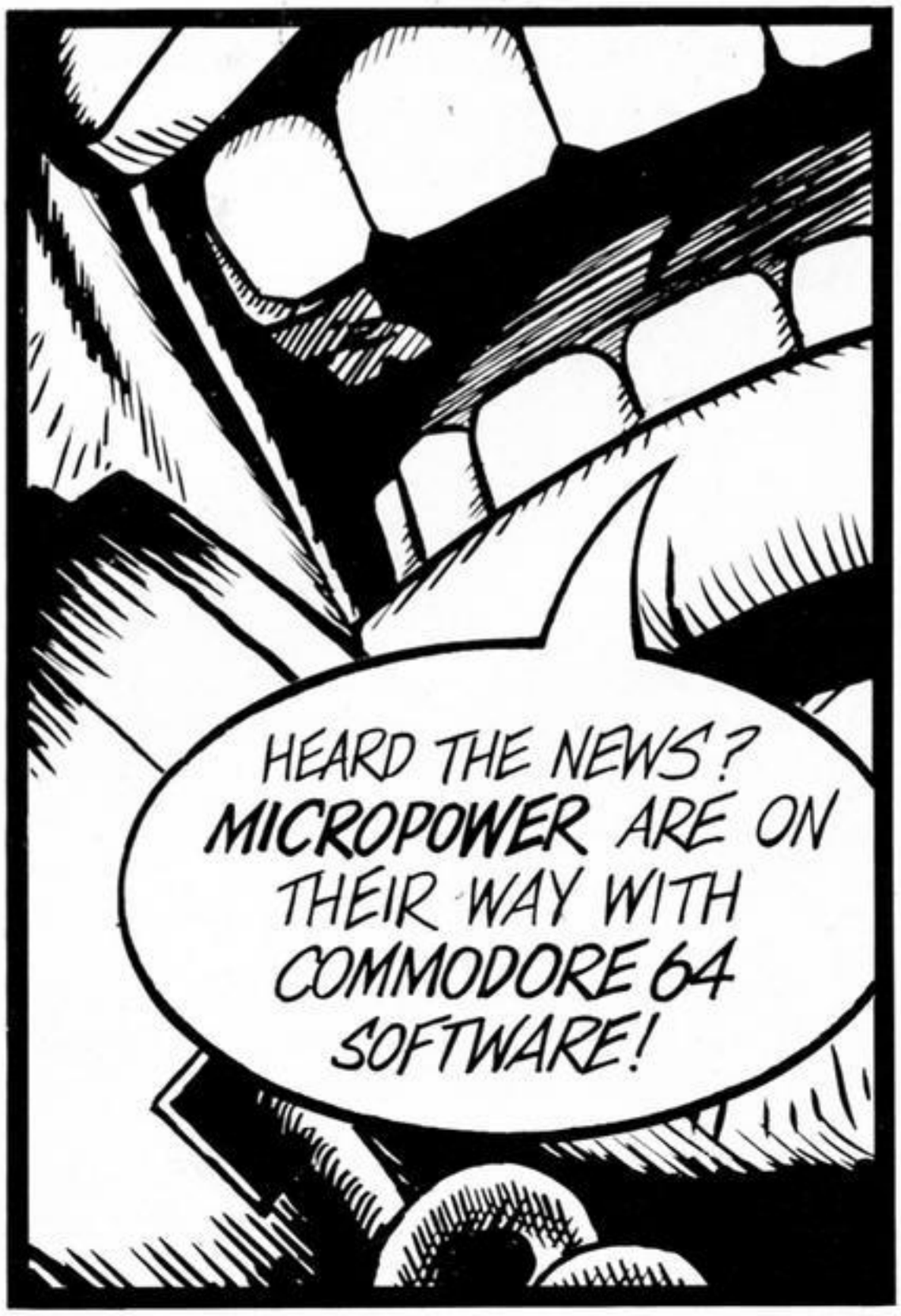

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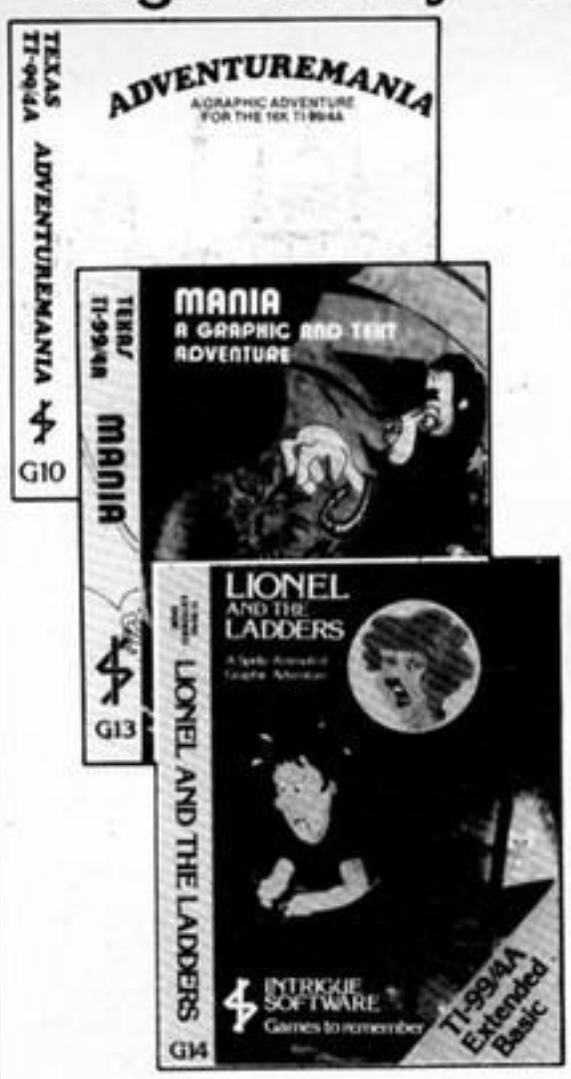

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Stomp them or shoot them — that's the question. It's all a matter of how much patience you have. Twelve geese have escaped into six wheat fields. Fortunately, you are only confronted by one at a time, but you must send them away before they gobble all the wheat. These crafty geese avoid cornering tactics by walking into ditches you can't cross. When the chase becomes tiresome it's all too tempting to stomp a goose by walking into it. Doing this loses points.

At random intervals a goose flies across the screen. You may shoot it by pressing the spacebar, but this is difficult and slow to respond.

Word Race will be familiar to viewers of Channel Four's Countdown. Two players participate, each taking turns to ask for vowels or consonants, randomly selected by the computer. Both players must then make a word using as many of the nine letters as possible in a limited time. Points are scored for using the most letters. The computer cannot verify the meaning or spelling of words, but will check that the letters used are legal. **J.W.**

instructions	85%
playability	80%
graphics	65%
value for money	90%

★ ★ ★ ★

Speed Snake + 16K ZX81 £4.95

Softchoice, 52 Platts Lane, London NW3 7NT

Two keys are all you need to steer the snake around the 10 mazes in this game. And, at times, two keys don't seem to give enough control. Plus signs represent the nuts you must eat to gather points, and inverse plus signs are berries to gather when ripe, but which only stay ripe for a tantalising short time. Poison balls are your enemy; if you eat them you die, you also die if you eat yourself.

Impossible, I hear you cry. Don't you believe it. The game is so fast and furious you can easily bump into yourself or any of the maze boundaries.

This is one of the few snake games in which the snake moves faster, the longer it gets. Imaginative use of the very limited graphics capabilities of the ZX81 make for a very enjoyable and exciting game. Although at first it might seem easy, it is deceptively difficult to master. Getting your name at the top of the hall of fame requires a lot of effort. **B.B.**

instructions	100%
playability	100%
graphics	95%
value for money	85%

★ ★ ★ ★

Take your pick

Make your choice from this collection of the latest software. Read what HCW's regular reviewers have to say before you pay out

Computerized Diet + 16K ZX81 £5.95

Softchoice, 52 Platts Lane, London NW3 7NT

If you have a weight problem it seems the modern solution is to talk it over with your ZX81!

This package is quite large with two cassettes and a 22-page booklet, and your first problem is digging out the cassettes from their plastic beds. However, the book is easier to extract, and is worth reading if only to dream of blueberry pie and baked bluefish.

Seriously though, you must read the book first because you have to prepare certain information about your eating habits before you can answer the questions on the first cassette. After the computer has digested the information regarding your age, sex, height and eating habits your own personal weight goals are assessed. Side B is concerned with producing menus based on different foods of different caloric values, giving recommended quantities and even taking your mood into account.

Because dieting is such a personal, sometimes very serious business, I can neither recommend nor condemn this program. Although I understand the program was written by a Dr M. Minsky I can find no reference to him in the handbook. **B.B.**

instructions	100%
playability	100%
graphics	40%
value for money	75%

★ ★ ★

Mr Munchee + 16K ZX81 £4.95

Softchoice, 52 Platts Lane, London NW3 7NT

Pac-Man, which started life on arcade video games machines, has been re-programmed for just about every home computer. Mr Munchee is not just a version for the ZX81, it is *the* version for the ZX81.

This is the third program by the same author I have reviewed, and each program has two things in common: good programming techniques and a very imaginative use of the rather dull ZX81 graphics.

There are three mazes, and with variable speed, this game is as challenging as any you are likely to meet on any machine. Having eaten one of the pellets scattered around the maze you have a very limited time in which to turn the tables on your pursuer. If you do manage to catch and eat it, you are rewarded with 200 points, which is also the prize for eating one of the protected cherries.

Although I am not an addict of this type of game, I did find this version very playable. As with all ZX81 games though, the rather negative feel of the keyboard doesn't make for very long games sessions. **B.B.**

instructions	100%
playability	100%
graphics	90%
value for money	90%

★ ★ ★ ★ ★

Home Budget 48K Spectrum £5.75

Kuma, Unit 12, Horseshoe Park, Horseshoe Rd, Pangbourne, Berks RG8 7JW

Computer budgeting should help those who are useless with figures and free those who are numerate from unnecessary tedium. Home Budget is a well laid-out program. You can adjust the expense headings as you wish, it offers help pages at most stages and it appears to be foolproof against wrong key entry.

However, there is no written documentation or loading instructions when simple explanations of how to budget would be invaluable. Also, why must the forecast figures be entered 12 times for each heading? The program should duplicate itself once the first month has been entered.

The answer "No" to "Are Actuals Correct?" after mis-entry is supposed to allow entry to a revision stage, but when I did it I found I could only exit by re-starting. The same answer to "Replace Forecast with Actual?" erased the forecast, and comparing the budget with actual is pointless if half the figures are missing.

Graphic representation of individual expenses and rolling budget feature. The reasonable price might make the problems bearable for those who are numerate. **D.C.**

instructions	80%
ease of use	50%
display	80%
value for money	75%

★ ★ ★

48K SPECTRUM OWNERS Read This From OCP

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These screens are just a sample to show the style of the program:

But that's not all, not by a long way. This program **automatically** raises a corresponding debit or credit for every entry, and will even open a new account if an entry features an unrecorded account name.

Information can be manipulated in various ways — you can call up your bank or credit card account, or analyse expenditure according to a variety of categories which you assign to the transactions. Instant Account balances can be listed at any time. A great time saving feature of this program is that account names and transaction descriptions need only be recorded **once**, as all the input fields will scroll existing files. There are many, many more features which make this the most powerful finance package around, we even include a test file for you to experiment with before getting started.

★ ★ ★ ADDRESS MANAGER ★ ★ ★

ADDRESS MANAGER utilises the same "on the page" presentation as FINANCE MANAGER and offers Spectrum owners a professional standard address filing, indexing and retrieval system. Below are examples of the screen presentations.

ADDRESS MANAGER has been carefully constructed to provide the user with a tool that is extremely friendly and easy to use, the speed and presentation of this program are second to none.

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ONE MAN'S VIEW

What's next for a ban?

It is generally accepted throughout the world that micro-technology is the field in which most of the future lies. Yet recent events — which occurred almost simultaneously — seem to suggest that the Establishment wishes to interfere with and directly control any advances made in this area.

The main event I speak of is, of course, the Ministry of Defence ban on JLC Data's software protection device.

The reason given for this was that it posed a threat to national security. Now, I'm only a 15-year-old schoolboy, but I don't think you'll consider my opinion too naive when I state that surely any enterprising criminal/Russian spy could get hold of this device, or at least adapt the permitted version (and make use of it), ban or no ban.

*Surely then, considering that software houses have craved after such a device for years and the fact that it is a British product and would save the country millions from piracy, it would be best **not** to impose such a ban?*

*The only conclusion I can reach over this, then, is that the government wishes to stop the product (which can apparently be used down phone lines) from becoming **generally** available, giving them the ability to keep unrestricted tabs on the vast majority of us.*

A recent Horizon programme, which many readers will have seen, dealt with exactly this subject and raised the question: "Given the choice of the government being able to listen in to all of us or none of us, which would you choose?"

They decided for none of us. The government itself, however, seems to think otherwise.

It is perhaps worth noting the security shindig which occurred at the GCHQ — a very sensitive area as far as bugging computer communications is concerned.

Now, I don't pretend for a minute to know how much of a threat its trade unions or whatever actually are, but the ban on them emphasises the already prominent question of what other restrictions Big Brother shall impose upon the computer industry in the name of National Security.

Ian Mitchell
Ponderer of Random Thoughts
South Shields, Tyne and Wear

• This space is for you to sound off about the micro scene, to present bouquets, to hurl brickbats, or just to share your opinions or experiences. Contributions from individuals earn a fee. Send your views to Paul Liptrot, Editor, Home Computing Weekly, No.1 Golden Square, London W1R 3AB

ABC
32K BBC £5.99

Compusoft, 32 Watchyard Lane, Formby, Nr Liverpool L37 3JU

This game is in BASIC and takes ages to load. I leave you to decide whether it's worth it.

'This had better educate me', he thinks, looking at the price.

I imagine this program is designed for four- to five-year olds. The menu gives you the choice of games or work. This bit must be for the teacher. Any child who can read this is too bright for the questions. Being your usual hardworking type of person, I opted for the games.

The letter game involves pressing the letter shown on the screen. If you get it right the picture is drawn; if you're wrong then you get a load buzz. The two other games are similar.

Alphabet display involves pressing a key so that the corresponding letter and picture are drawn.

The instructions give no idea what happens if you are wrong. Small children may not understand. The pictures are reasonable but take a long time to draw. A child may be more patient but I'm sure would soon become bored.

I don't think many schools would be willing to spend £6 on a game of this quality. **D.B.**

instructions	60%
playability	80%
graphics	70%
value for money	40%

★ ★

Music (7 +)
48K Spectrum
£7.95

Argus Press Software, No.1 Golden Square, London W1R 3AB

There are two programs on side one, Piano Player and Composer, and one on side two, Musical Quiz.

Piano Player shows five black and seven white keys. The note played is depressed on screen while shown below, together with the octave and length of note (from 0.05 to 1 second) which may both be altered by four keys. Pressing z returns us to the menu — a useful facility.

Composer allows you to play a composed or demonstration tune, save, load or compose a tune. For composition, using up to 1000 notes, screen top has five staves and notes of rest and note number. Nine keys allow choice of note, duration, rest or correction and playback.

In Musical Quiz, Clever Clogs asks 100 Grade One multiple choice questions, which may be altered. You start with a choice of six tunes, building up note by note at screen top with the correct answers. Clever Clogs smiles or grimaces, correct answers are shown and the tune plays at the end. **T.W.**

instructions	85%
ease of use	85%
display	90%
value for money	90%

★ ★ ★ ★ ★

Star Trucker
(9 +) 48K
Spectrum
£7.95

Argus Press Software, No.1 Golden Square, London W1R 3AB

An addictive learning game, a competition to win a year's magazine subscription and a Secret Parents' Page enabling questions to be reset: what more can Computertutor offer? Full use is made of the Spectrum's potential in this brainteasing game built around general knowledge questions.

A star-studded screen has a noisy rocket leaving 'welcome to Star Trucker' behind, followed by an invitation to enter a 'Christian' name: wouldn't 'first' name be more multi-cultural?

On screen is the view forward, above digital read-outs of time, score, credits, cargo, fuel, field and points. The first task is to manoeuvre through the asteroid belt to refuel at Earth with 100 credits. Credits and force field are topped up from points gained by correctly answering general knowledge questions.

A hyper-jump leads to the planet screen, where galactic dust guards the trading planets. Remembering what they exchange, you work out a route around the planets to end up with power gems. Disasters strike unexpectedly, robbing you of force field or credits, and you can be killed: if so, an offical Star Trucker newsflash tells the world. **T.W.**

instructions	90%
ease of use	90%
display	85%
value for money	88%

★ ★ ★ ★

Back to school

Start the new term with these reviews of the latest in educational software

Wizard Box
48K Spectrum
£6.95

Scisoft, 5 Minster Gardens, Newthorpe, Eastwood, Notts

A wizard program for teachers and parents who are eager to improve children's spelling and vocabulary on an individual basis. For the busy non-programmer it is the ideal answer, as it provides all the necessary cues to enter up to 10 sets of 10 words.

After each test there is a magic trick and then the set repeats if any were wrong, or a new one is set. A report card appears with name, score and comment, which may be printed. Then a top hat is shown, from which comes ten stars listing those words spelt wrongly. Up to 45 names can be accepted — enough for a whole class — and up to ten sets of scores for each child.

It is a shame that this first-class program should be spoilt by the poor instructions in the accompanying booklet. Can anyone tell me how to reach the French vocabulary or general knowledge quiz? That aside, this program makes good use of the colour, sounds and graphics capabilities of the Spectrum, although they could have devised a means of of escaping back to the menu. **T.W.**

instructions	50%
ease of use	70%
display	80%
value for money	85%

★ ★ ★ ★

Chemistry 1
Electron/BBC B
£6.90

Sunland, 204 High St West, Sunderland SR1 1UA

Sadly there are still many educational programmers who insist upon producing computer packages comprising rote learning better suited to simple teaching machines or crammers. This is such a package.

The program does not make use of the sophistication available on the BBC and the use of colour is appalling. Green sand! Red palm trees! Poor graphics; no variation of colour in printing; very poor layout; poor programming structure and one facility missing from this package, vital to non-programmers, is a simple method of changing data. Neither is there any protection against young fingers hitting escape or break.

The program has adequate but poorly laid out screen instructions and a total of 100 questions contained in four blocks of data. There is a choice of revision or three types of test on typical 'O' level chemistry exam questions, Answers to wrongly answered questions are displayed at the end of each test and an irrelevant picture is then displayed showing how close the user came to collecting a coconut.

A very unimaginative and tedious program suited to someone desperate to learn limited facts as quickly as possible.

instructions	60%
playability	80%
graphics	20%
value for money	20%

★

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1	Jet Set Willy	Software Projects	Spectrum (1)
2	Chequered Flag	Psion	Spectrum (9)
3	Manic Miner	Software Projects	CBM 64 (-)
4	Atic Atac	Ultimate	Spectrum (3)
5	Scuba Dive	Durrell	Spectrum (2)
6	Jack & The Beanstalk	Thor	Spectrum (-)
7	Crazy Kong	Intega Micros	VIC-20 (-)
8	Moon Alert	Ocean	Sprectum (-)
9	Codename MAT	Micromega	Spectrum (7)
10	The Guardian	PSS	Spectrum (-)

NON-ARCADE

1	Fall of Rome	APS	Spectrum (-)
2	Golf 64	Abrasco	CBM 64 (2)
3	Fighter Pilot	Digital	Spectrum (-)
4	Flight Path 737	Anirog	CBM 64 (-)
5	Twin Kingdom Valley	Bug Byte	CBM 64 (1)
6	Colossus Chess	CDS	CBM 64 (-)
7	Star Trucker	Clever Clogs	Spectrum (-)
8	Test Match	CRL	Spectrum (-)
9	The Wizard & The Princess	Melbourne House	VIC-20 (-)
10	Pool	Bug Byte	Spectrum (-)

Compiled with the assistance of Britain's leading software distributors, including: Pinnacle, SDL, PCE, Websters, PCS and Software Centre.

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4	Atic Atac	Ultimate (3)
5	Scuba Dive	Durrell (6)
3	Atic Atac	Ultimate (6)
4	Blue Thunder	Richard Wilcox (-)
5	Hunchback	Ocean (4)
6	Jack and the Beanstock	Thor (-)
7	Escape from Krakatoa	Abbex (-)
8	Moon Alert	Ocean (-)
9	Codename MAT	Micromega (5)
10	The Guardian	PSS (8)

COMMODORE 64

1	Manic Miner	Software Projects (-)
2	Black Hawk	Thorn EMI (4)
4	Space Shuttle	Microdeal (6)
5	Pedro	Imagine (-)
6	Space Pilot	Anirog (-)
7	Slurpy	Thorn EMI (5)
8	Mr Wimpy	Ocean (3)
9	Transylvanian Tower	Richard Shepherd (-)
10	It's only Rock 'n' Roll	K-tel (7)
8	Intro to Basic	Commodore (-)
9	Falcon Patrol	Virgin (-)
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DRAGON 32

1	Chuckie Egg	A & F (2)
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3	Ughl	Softek (4)
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6	Skramble	Microdeal (-)
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8	S.A.S.	Peaksoft (10)
9	Up Periscope	Beyond (8)
10	Cuthbert in the Jungle	Microdeal (-)

Compiled by W. H. Smith and Websters. Figures in brackets are last week's positions.

VIC-20

1	Crazy Kong	Interceptor Micro (6)
2	Sub Commander	Thorn EMI (2)
3	M.L.B.A.T.E.T.	Llamasoft (8)
4	Tank Commander	Thorn EMI (3)
5	Jet Pac	Ultimate (10)
6	Tower of Evil	Thorn EMI (4)
7	Snooker	Visions (5)
7	Tiny Tutor	Marketing Micro (-)
9	Gridrunner	Llamasoft (7)
10	Mine Madness	Thorn EMI (9)

BBC

1	737 Simulator	Salamander (-)
2	O Man	MRM (2)
3	Chess	BBC (5)
4	O Man's Brother	MRM (3)
5	Killer Gorilla	Precision Micro (7)
6	3D Munchy	MRM (4)
7	Demolator	Visions (1)
8	Diamond Mine	MRM (6)
9	Tank Attack	Gemini (-)
10	Dr Who 1st Adventure	BBC (-)
10	GB Ltd	Simon Hessel (8)

ZX81

1	Krazy Kong	PSS (1)
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3	Mothership	Sinclair (5)
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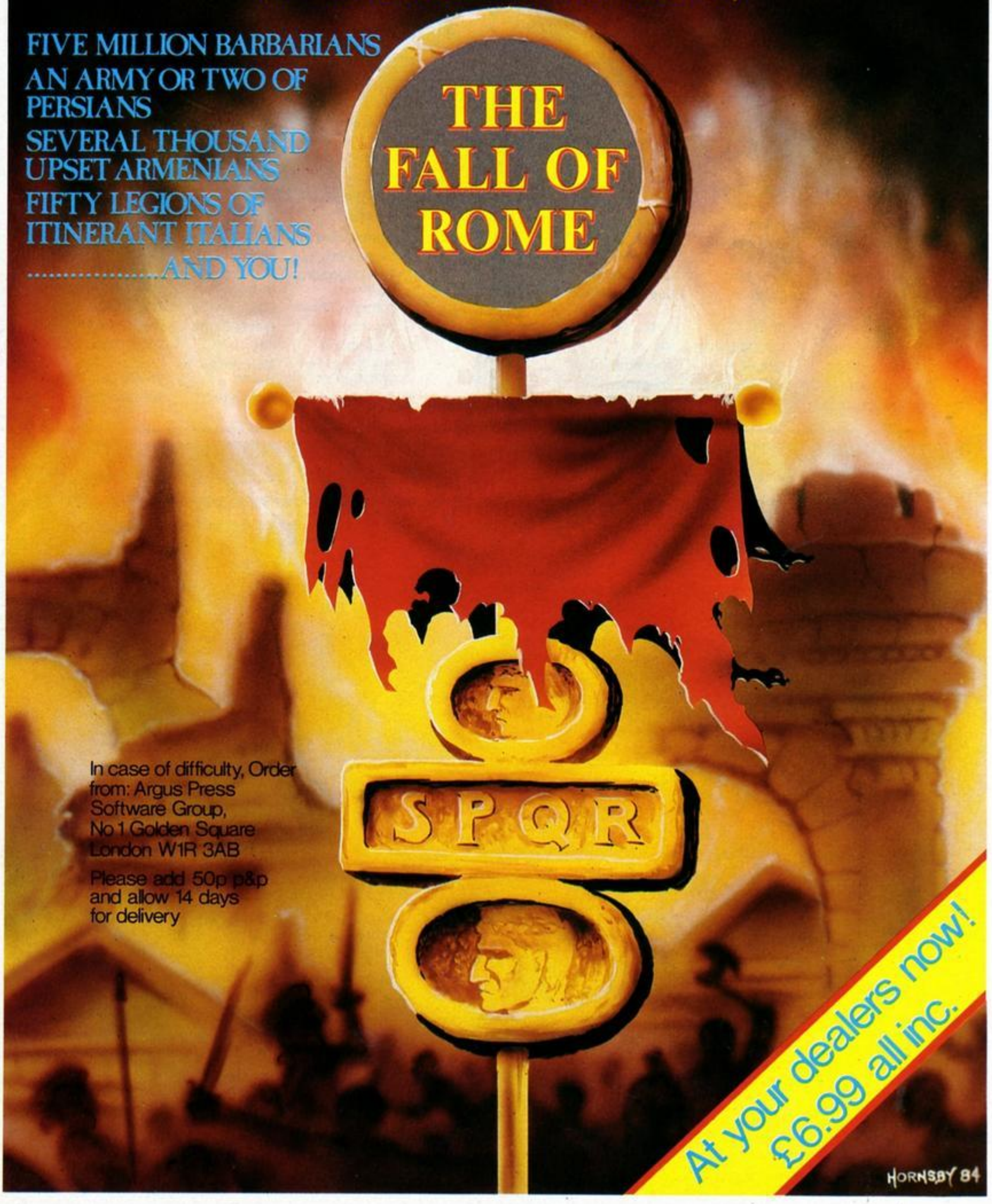

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HORNSBY 84

Great graphics which don't steal too much of your RAM

Most 64 owners will be aware how powerful the graphics capabilities of the machine are. There are several packages on the market for extending BASIC to use these capabilities and, in fact, David Rees described a do-it-yourself package in recent issues of Home Computing Weekly.

Most packages, David Rees' version included, have the disadvantage that although they offer a full range of facilities, they also tend to steal a large hunk of RAM. If you only want one or two bits of the package, they may prove impracticable.

In this article I shall describe some routines which, although they may be included in David's package, can be used on their own with a minimal overhead in RAM. The routines are all aimed at the use of graphics.

There seems to be a lot of inverted snobbery concerning high-resolution graphics. Whilst their use is ideal for graph plotting routines, they tend to be RAM hungry, often slow and do have some limitations. For example, can you create an animated drawing of a river using high-resolution graphics? It's easy using redefined characters! These routines will offer easy alternatives to hi-res. Whilst all routines operate independently, they can be used together.

The first routine gives pseudo teletext capabilities by enabling you to plot points and draw lines to a 80 by 50 resolution. Two simple commands are available:

To set or clear a point: SYS 49152,X,Y,Colour,Type. Type = 1 to set the point, type = 0 to clear the point.

To draw a line: SYS 49155,X1, Y1,X2,Y2,Colour,Type

Type

1 draw line

0 erase line

These routines assume that the screen memory is in its normal place. They will not work if you move the screen. For fast drawing, it is best to use the routines directly from machine code. For machine code hacks, I'll give details of the entry points later.

Listing 1 gives a BASIC loader for these routines. **Demo 1** shows how they work.

Most computers have the option for user defined characters. The 64 is no exception and, true to form, there is no command for creating them. The next set of routines fill this gap.

The first problem is where to put the new characters. To maintain compatability with the plotting routines we are compelled to keep the screen in its normal place. To minimise loss of RAM, the new characters are put in a block from 2048 to 4095. To protect this area, we must shunt the start of BASIC up to 4096. There are two ways of doing this. First type in as a direct command the line:

POKE 44,16: POKE 256*16,0: NEW

As an alternative, a routine in this package can be used to do the job. Both of these methods will destroy any BASIC program in memory, so it is wise to do this job first. The call to protect the graphics is:

SYS 49926,X

If X has any value other than 255, the bottom of BASIC is simply raised. A value of 255 will auto load the next program on tape giving a means of booting a sequence of programs. The remainder of the commands are:

1 SYS 49920,SET
SET = 0 gives upper case.
SET = 1 gives lower case.

This routine switches in the new set and copies the specified characters from RAM to the new set. So that you know that all is well, a message is given when this command has finished. If you don't want the message to appear, e.g. in the middle of a program, poke location 1000 with 255.

2 SYS 49923 [N],B1,B2,B3, B4,B5,B6,B7,B8

This defines the shape of character N. The square brackets are used so that you can easily see which character is involved. The eight parameters specify the shape of the character.

3 SYS 49929.. enable user defined set.
SYS 49932.. disable user defined set.

These are simple switches to enable you to use text or redefined characters as required.

Listing 2 gives a BASIC loader for these routines. Try **demo 2** to see what can be achieved with redefined characters. Look at Jeff Minter's Matrix or COSMI's Aztec Challenge to see what can be done with some cunning tricks.

The next block of routine,

Listing 1 — medium resolution plot

```
20 REM
30 REM
40 DATA76,51,194,76,111,194,72,152,72,138,72,169,0,141,68,3,141,64,3,169,252
50 DATA173,133,3,133,251,165,251,201,50,144,3,238,68,3,173,134,3,201,80,144
60 DATA3,238,68,3,173,68,3,240,3,76,187,194,169,47,56,ed9,c01,133,251,78,134
70 DATA3,46,64,3,78,251,46,64,3,6,251,6,251,6,251,165,251,6,251,38,252,6,251
80 DATA38,252,24,101,251,133,251,165,252,105,4,133,252,144,64,3,169,1,141,64
90 DATA3,224,0,240,6,14,64,3,202,144,246,172,132,3,177,251,162,0,221,193,192
100 DATA240,13,232,224,16,144,246,169,4,141,68,3,76,16,192,173,135,3,240,6
110 DATA136,13,64,3,24,178,144,13,173,64,3,73,255,141,64,3,136,45,64,3,170,189
120 DATA193,192,172,132,3,145,251,24,165,252,105,e1a,133,252,173,16,3,145,251
130 DATA104,170,104,168,104,96,32,126,143,97,124,226,255,236,106,127,98,252
140 DATA225,251,254,160,72,152,72,136,72,169,255,141,138,3,173,134,3,201,80
150 DATA144,5,160,1,76,42,194,173,136,3,201,80,144,5,160,2,76,42,194,173,135
160 DATA3,201,50,144,5,160,3,76,42,194,173,137,3,201,50,144,5,160,4,76,42,194
170 DATA173,136,3,56,237,134,3,141,65,3,173,137,3,56,237,135,3,141,66,3,169
180 DATA1,141,67,3,141,68,3,173,66,3,16,18,160,255,140,6,3,73,255,24,105,1
190 DATA141,69,3,173,65,3,16,18,160,255,140,66,3,73,255,24,105,1,141,70,3,173
200 DATA70,3,56,237,69,3,141,71,3,16,35,169,255,141,72,3,169,0,141,73,3,173
210 DATA69,3,141,74,3,173,70,3,141,75,3,173,66,3,46,5,169,1,141,72,3,76,154
220 DATA193,169,0,141,72,3,169,255,141,73,3,173,70,3,141,74,3,173,69,3,141
230 DATA75,3,173,65,3,46,5,169,1,141,76,3,173,74,3,141,76,3,56,237,75,3,141
240 DATA78,3,173,75,3,141,77,3,78,74,3,173,75,3,56,237,74,3,141,79,3,173,134
250 DATA3,141,132,3,173,135,3,141,133,3,173,139,3,206,4,169,0,240,13,201,1
260 DATA208,4,169,1,206,5,173,136,3,73,255,141,138,3,32,6,194,173,79,3,16,38
270 DATA24,109,77,3,141,79,3,173,134,3,24,109,79,3,141,134,3,173,135,3,24,109
280 DATA72,3,141,135,3,76,32,194,56,237,76,3,141,79,3,173,134,3,24,109,69,3
290 DATA141,134,3,173,135,3,24,109,67,3,141,135,3,206,76,3,46,3,76,166,193
300 DATA160,0,140,69,3,104,170,104,168,104,96,32,253,174,32,138,173,32,247
310 DATA183,165,20,141,132,3,32,253,174,32,138,173,32,247,183,165,20,141,133
320 DATA3,32,253,174,32,138,173,32,247,183,165,20,141,18,3,32,253,174,32,138
330 DATA173,32,247,183,165,20,141,136,3,76,6,192,96,32,253,174,32,138,173,32
340 DATA247,183,165,20,141,134,3,32,253,174,32,138,173,32,247,183,165,20,141
350 DATA135,3,32,253,174,32,138,173,32,247,183,165,20,141,136,3,32,253,174
360 DATA32,138,173,32,247,183,165,20,141,137,3,32,253,174,32,138,173,32,247
370 DATA183,165,20,141,18,3,32,253,174,32,138,173,32,247,183,165,20,141,139
380 DATA3,76,209,192
390 T=0:FORI=49152 TO 49861
400 READ X: T=T+X: POKEI,X:NEXT
410 IF T<>75395 THEN PRINT"DATA ERROR"
420 REM**********************************
430 REM*   MEDIUM RESOLUTION PLOT     *
440 REM* THIS OCCUPIES $C000-$C2C5    *
450 REM*                              *
460 REM**********************************
```

Listing 2 — user-defined characters

```
10 LISTING 2
20 REM
30 REM
40 DATA76,15,195,76,202,195,76,67,196,76,100,196,76,107,196,32,253,174,32,138
50 DATA173,32,247,183,165,20,240,13,169,224,141,131,3,169,216,141,130,3,76
60 DATA51,195,169,216,141,131,3,169,200,141,130,3,169,0,133,253,173,130,3,133
70 DATA254,169,0,133,251,169,8,133,252,173,14,220,41,254,141,14,220,165,1,41
80 DATA251,133,1,160,0,177,253,145,251,165,251,24,105,1,133,251,165,252,105
90 DATA0,133,252,24,165,253,105,1,133,253,165,254,105,0,133,254,165,255,208
100 DATA222,165,254,205,131,3,208,215,165,1,9,4,133,1,173,14,220,9,1,141,14
110 DATA220,169,18,141,24,208,173,202,3,201,255,208,1,96,169,160,160,195,32
120 DATA30,171,96,147,42,42,32,82,69,45,68,69,70,73,78,69,66,76,69,32,67,72
130 DATA65,82,65,67,84,69,82,32,83,69,84,32,69,78,65,66,76,69,68,32,42,42,0
140 DATA169,91,32,255,174,32,138,173,32,247,183,165,20,133,251,165,21,240,44
150 DATA169,229,160,195,32,30,171,96,63,32,67,72,65,82,65,67,84,69,82,32,78
160 DATA85,77,66,69,82,32,71,82,69,65,84,69,82,32,84,72,65,78,32,50,53,53,0
170 DATA169,0,133,252,169,93,32,255,174,6,251,38,252,6,251,38,252,6,251,38
180 DATA252,24,165,252,105,8,133,252,169,0,141,232,3,32,253,174,32,138,173
190 DATA32,247,183,172,232,3,165,20,145,251,200,238,232,3,192,8,208,232,96
200 DATA32,253,174,32,138,173,32,247,183,165,20,201,255,208,9,169,131,141,119
210 DATA2,169,1,133,198,169,16,141,138,2,32,248,252,96,169,18,141,24,208,96
220 DATA96,169,21,141,24,208,96
230 T=0:FORI=49920 TO 50208
240 READ X: POKEI,X: T=T+X:NEXT
250 IF T<>43474 THEN PRINT"ERROR IN DATA"
260 REM**********************************
270 REM*   USER DEFINED CHARACTERS    *
280 REM*                              *
290 REM* THIS OCCUPIES $C300-$C470    *
300 REM*                              *
310 REM**********************************
```

Listing 3, is of more limited value but can be linked with the plotting routines to produce billboard type displays. The routine draws a large character at a specified position on the screen. The characters generated are macros built up from the standard CBM characters and are four characters high and four characters wide. Any of the numbers or alphabet are available. The routine is called with:

SYS 50432,X,Y,CH,COLOUR

where Y is the row where the top left hand corner of the character starts (0-24); X is the column where the character starts (0-39); CH is the ASCII value of the character (eg CH = ASC("A")); COLOUR is the colour of the character.

The final set of routines give a full range of scroll and roll routines. The scroll routines move the screen one character in the required direction and put a blank line at the other end of the screen. Roll moves the screen contents and puts the lost line at the other end of the screen (similar to a continuous conveyor belt). Both the screen and colour memories are scrolled so that the appearance of the screen is preserved.

The routines are called by:

scroll down	SYS 52742
roll down	SYS 51826
scroll left	SYS 52123
roll left	SYS 52182
scroll right	SYS 51992
roll right	SYS 52049

The contents of location 901 specifies the number of rows scrolled or rolled to the left or right. It has no effect on the scroll and roll down. **Listings 4 and 5** load these routines. The listings can be used independently. **Demo 4** incorporates many of these routines to show what is possible.

Machine code aspects of low-res plot: The interfacing of the plotting routines to your own machine code routines is a simple matter:

Point plot:
X in location 900
Y in location 901
Colour in 786
Point type in 906
Entry point $C006

Line plot:
X1 in 902
Y1 in 903
X2 in 904
Y2 in 905
Colour in 786
Line type in 907
Entry Point $C0D1

Listing 3 — large 4 x 4 characters

```
20 REM
30 REM
40 DATA32,253,174,32,138,173,32,247,183,165,20,141,134,3,32,253,174,32,138
50 DATA173,32,247,183,165,20,141,135,3,32,253,174,32,138,173,32,247,183,165
60 DATA20,141,132,3,32,253,174,32,138,173,32,247,183,165,20,141,134,2,173,132
70 DATA3,201,91,16,47,201,47,48,43,56,233,48,141,132,3,174,135,3,172,134,3
80 DATA24,32,240,255,172,132,3,185,111,197,133,251,185,154,197,133,252,160
90 DATA0,177,251,201,64,240,6,32,210,255,200,208,244,96,146,179,194,215,240
100 DATA13,40,73,90,123,156,157,158,159,160,161,162,197,228,7,36,67,90,109,140
110 DATA174,193,212,235,250,29,64,95,121,152,182,209,227,4,35,68,99,121,200
120 DATA200,200,200,200,201,201,201,201,201,201,201,201,201,201,201,201,197
130 DATA197,198,198,198,198,198,198,198,198,198,198,198,199,199,199,199,199
140 DATA199,199,199,200,200,200,200,200,172,18,162,146,187,17,157,157,157,161
150 DATA32,18,161,17,157,157,157,172,162,187,17,157,157,157,146,161,32,18,161
160 DATA146,64,18,172,162,146,191,17,157,157,157,18,188,146,162,18,191,17,157
170 DATA157,157,146,161,32,18,161,17,157,157,157,188,146,162,18,191,146,64
180 DATA172,18,162,146,191,17,157,157,157,161,32,32,17,157,157,157,161,32,32
190 DATA17,157,157,157,188,162,18,191,146,64,18,172,162,146,187,17,157,157
200 DATA157,161,32,18,161,17,157,157,157,146,161,32,18,161,17,157,157,157,188
210 DATA146,162,190,64,18,172,162,162,17,157,157,157,188,146,162,17,157,157
220 DATA161,17,157,18,188,146,162,162,64,18,172,162,162,17,157,157,157,188
230 DATA146,162,17,157,157,161,17,157,161,64,172,18,162,146,191,17,157,157
240 DATA157,161,32,32,17,157,157,157,161,32,18,187,146,17,157,157,157,188,162
250 DATA18,191,146,64,161,32,18,161,17,157,157,157,18,188,146,162,18,190,17
260 DATA157,157,157,146,161,32,18,161,146,17,157,157,157,161,32,18,161,146
270 DATA64,29,188,18,172,146,17,157,161,17,157,161,17,157,157,172,18,188,146
280 DATA64,29,188,18,172,17,157,146,161,17,157,161,17,157,157,157,191,162,190
290 DATA64,161,32,18,191,17,157,157,157,188,191,17,157,157,172,146,191,17,157
300 DATA157,161,32,191,64,161,17,157,161,17,157,161,17,157,18,188,146,162,162
310 DATA64,18,188,146,32,18,190,17,157,157,157,146,161,18,162,161,17,157,157
320 DATA157,146,161,32,18,161,17,157,157,157,146,161,32,18,161,146,64,18,188
330 DATA146,32,18,161,146,17,157,157,157,161,161,18,161,146,17,157,157,157
340 DATA161,18,161,161,146,17,157,157,157,161,32,18,187,146,64,172,18,162,146
350 DATA187,17,157,157,157,161,32,18,161,146,17,157,157,157,161,32,18,161,146
360 DATA17,157,157,157,188,162,190,64,18,172,162,146,191,17,157,157,157,18
370 DATA188,146,162,18,191,17,157,157,157,146,161,17,157,146,161,64,172,18
380 DATA162,146,187,17,157,157,157,161,32,18,161,146,17,157,157,157,161,172
390 DATA18,161,146,17,157,157,157,188,162,191,64,18,172,162,146,191,17,157
400 DATA157,157,18,188,146,162,18,191,17,157,157,157,146,161,191,17,157,157
410 DATA146,161,32,191,64,18,191,162,146,191,17,157,157,157,191,187,17,157
420 DATA157,32,188,191,17,157,157,157,191,162,18,191,146,64,188,18,187,162
430 DATA17,157,157,146,18,161,17,157,161,17,157,161,146,64,161,32,18,161,146
440 DATA17,157,157,157,161,32,18,161,146,17,157,157,157,161,32,18,161,146,17
450 DATA157,157,157,191,162,18,191,146,64,161,32,18,161,146,17,157,157,157
460 DATA161,32,18,161,146,17,157,157,157,161,32,18,161,146,17,157,157,157,188
470 DATA162,190,64,161,32,18,161,146,17,157,157,157,161,32,18,161,146,17,157
480 DATA157,157,161,162,18,161,17,157,157,157,172,146,32,18,187,146,64,161
490 DATA32,18,161,146,17,157,157,157,188,162,190,17,157,157,157,172,18,162
500 DATA146,187,17,157,157,157,161,32,18,161,146,64,18,161,146,32,18,161,146
510 DATA17,157,157,191,190,17,157,18,157,161,17,157,161,146,64,18,162,162,187
520 DATA146,17,157,157,172,190,17,157,157,157,172,190,17,157,157,18,188,146
530 DATA162,162,64,18,191,162,146,191,17,157,157,157,161,29,18,161,17,157,157
540 DATA157,146,161,29,18,161,17,157,157,157,146,191,162,18,191,146,64,32,18
550 DATA190,17,157,161,17,157,161,17,157,190,146,187,64,18,191,162,146,191
560 DATA17,157,18,191,17,157,157,191,17,157,157,190,146,162,162,64,18,191,162
570 DATA146,191,17,157,157,162,18,191,17,157,161,17,157,157,157,146,191,162
```

Listing 4 — scroll and roll down

```
10 LISTING 4
20 REM
30 REM
40 DATA169,192,133,176,133,187,169,152,133,188,133,189,169,7,133,177,133,181
50 DATA169,219,133,188,133,190,169,24,141,0,192,96,32,0,202,160,39,177,160
60 DATA145,176,177,189,145,187,136,16,245,206,0,192,48,45,165,188,133,176,165
70 DATA181,133,177,165,189,133,187,165,190,133,188,56,165,180,233,40,133,180
80 DATA165,181,233,0,133,181,56,165,189,233,40,133,189,165,190,233,0,133,190
90 DATA24,144,193,160,39,169,0,133,176,169,4,133,177,169,32,145,176,136,16
100 DATA251,96,160,39,185,192,7,153,62,3,185,192,219,153,122,3,136,16,241,32
110 DATA0,202,160,39,177,180,145,176,177,189,145,187,136,16,245,206,0,192,48,
120 DATA45,165,180,133,176,165,181,133,177,165,189,133,187,165,190,133,188,56
130 DATA165,180,233,40,133,180,165,181,233,0,133,181,56,165,189,233,40,133
140 DATA189,165,190,233,0,133,190,24,144,193,160,39,165,62,3,153,0,4,185,122
150 DATA3,153,0,216,136,16,241,96
160 T=0: FOR I= 51712 TO 51926
170 READ X:T=T+X: POKEI,X: NEXT
180 IF T<>23451 THEN PRINT"ERROR IN DATA"
190 REM**********************************
200 REM*    SCROLL AND ROLL DOWN        *
210 REM*                                *
220 REM* THIS OCCUPIES $CA00 TO $CA72 *
230 REM**********************************
```

Listing 5 — scroll/roll left and right

```
10 LISTING 5
20 REM
30 REM
40 DATA173,133,3,141,132,3,206,132,3,169,0,133,176,133,187,169,4,133,177,169
50 DATA216,133,188,96,32,0,203,160,38,177,176,200,145,176,136,177,187,200,145
60 DATA187,136,136,16,241,160,0,169,32,145,176,206,132,3,48,25,24,165,176,105
70 DATA40,133,176,144,2,230,177,24,165,187,105,40,133,187,144,208,230,188,24
80 DATA144,203,96,32,0,203,160,39,177,176,141,134,3,177,187,141,135,3,136,177
90 DATA176,200,145,176,136,177,187,200,145,187,136,136,16,241,160,0,173,134
100 DATA3,145,176,173,135,3,145,187,206,132,3,48,25,24,165,176,105,40,133,176
110 DATA144,2,230,177,24,165,187,105,40,133,187,144,191,230,188,24,144,186,96
120 DATA32,0,203,160,1,177,187,136,145,187,200,177,176,136,145,176,200,200,192
130 DATA40,208,239,160,39,169,32,145,176,206,132,3,48,25,24,165,176,105,40
140 DATA133,176,144,2,230,177,24,165,187,105,40,133,187,144,206,230,188,24
150 DATA144,201,96,32,0,203,160,0,177,176,141,134,3,177,187,141,135,3,200,177
160 DATA187,136,145,187,200,177,176,136,145,176,200,200,192,40,208,239,160
170 DATA39,173,134,3,145,176,173,135,3,145,187,206,132,3,48,25,24,165,176,105
180 DATA40,133,176,144,2,230,177,24,165,187,105,40,133,187,144,189,230,188
190 DATA24,144,184,96
200 T=0: FORI=51969 TO 52257
210 READ X: POKE I,X: T=T+X: NEXT
220 IF T <> 37953 THEN PRINT"ERROR IN DATA"
230 REM**********************************
240 REM*  SCROLL/ROLL LEFT AND RIGHT  *
250 REM*                              *
260 REM* THIS OCCUPIES $CB00 TO $CC21 *
270 REM**********************************
```

Why use a big graphics program when you're only going to use parts of it? These routines, by HCW regular Allen Webb, are fast memory-efficient alternatives

```
10 REM DEMONSTRATION 1
20 REM
30 REM LOW RESOLUTION PLOTTING
40 REM
50 SA = 49152: COLOUR = 1: TYPE = 1: PRINTCHR$(147)
60 FOR X2 = 0 TO 79 STEP 2
70 SYS SA+3,39,0,X2,49,COLOUR,TYPE
80 NEXT X2
90 COLOUR = 3
100 FOR X2 = 0 TO 79 STEP 2
110 SYS SA+3,39,49,X2,0,COLOUR,TYPE
120 NEXT X2
130 COLOUR = 5:FOR Y = 0 TO 49
140 DN = RND(1)*20
150 FOR I = 1 TO DN
160 SYS SA, RND(1)*80,Y,COLOUR,TYPE
170 NEXT I
180 NEXT Y
190 FOR D = 1 TO 1000 :NEXT
200 RUN
```

Demonstration 1 — low resolution plotting

```
10 REM DEMONSTRATION 2
20 REM
30 REM USER DEFINED CHARACTERS
40 REM
50 REM ********** WARNING **********
60 REM RAISE THE START OF BASIC BEFORE
70 REM      RUNNING THIS PROGRAM
80 REM ********************************
90 REM
100 POKE1000,255:REM NO MESSAGE
110 POKE53280,1:POKE53281,1:REM WHITE SCREEN
120 SA=49920:REM START OF ROUTINES
130 SYS SA,0:REM UPPER CASE SET
140 GOSUB 310
150 GOSUB450 : REM FILL SCREEN WITH BLANKS (CHARACTER 32)
160 SYS SA+3 [32],255,129,129,129,129,129,129,255:GOSUB440
170 SYS SA+3 [32],255,255,195,195,195,195,255,255:GOSUB440
180 SYS SA+3 [32],255,255,255,231,231,255,255,255:GOSUB440
190 SYS SA+3 [32],255,255,255,255,255,255,255,255:GOSUB440
200 C=C+1:IFC<20THEN160
210 SYS 49923 [32],0,0,0,0,0,0,0,0
220 GOSUB450:FORI=1TO8:READ Y(I):NEXT
230 FORI=1TO9
240 FORJ=1TO8:X(J)=Y(I):NEXT
250 X(I)=255
260 SYS SA+3 [32],X(1),X(2),X(3),X(4),X(5),X(6),X(7),X(8)
270 NEXT:C=C+1:IFC<30THEN230
280 RUN
290 DATA 7,1,4,8,2,6,3,5
300 DATA 128,64,32,16,8,4,2,1
310 FORI=1TO26: SYS SA+3 [I],0,0,0,0,0,0,0,0 : NEXT:GOSUB450
320 PRINT"■■■■■■■■■■"TAB(3)"A SHORT DEMONSTRATION SHOWING WHAT"
330 PRINT"■■"TAB(3)"CAN BE ACHIEVED WITH USER DEFINED"
340 PRINT"■■"TAB(15)"CHARACTERS"
350 POKE56334,PEEK(56334)AND254
360 POKE1,PEEK(1)AND251
370 FOR I=1TO8: READ K
380 FOR J=1TO27
390 POKE 2048+(J-1)*8+K,PEEK(53248+(J-1)*8+K):NEXTJ,I
400 POKE1,PEEK(1)OR4
410 POKE56334,PEEK(56334)OR1
420 FORD=1TO100:Z=RND(1)*256 :SYS 49923 [32],Z,Z,Z,Z,Z,Z,Z,Z:NEXT
430 SYS 49923 [32],0,0,0,0,0,0,0,0:RETURN
440 FORI=1TO20:NEXT:RETURN:REM DELAY
450 O$="":FORI=1TO39:O$=O$+CHR$(32):NEXT
460 PRINT"■■":FORI=1TO23:PRINT"■"O$:NEXT:PRINT"■":RETURN
```

Demonstration 2 — user-defined characters

```
10 REM DEMONSTRATION 3
20 REM
30 REM USE OF 4 BY 4 ENLARGED CHARACTERS
40 REM
50 PRINTCHR$(147)
60 ME$="A TEST": Y=0: XS=6: GOSUB 120
70 ME$=" DEMO": Y=5: XS=6: GOSUB 120
80 ME$=" USING": Y=10: XS=3: GOSUB 120
90 ME$=" LARGE": Y=15: XS=3: GOSUB 120
100 ME$="LETTERS": Y=20: XS=3: GOSUB 120
110 COLOUR=RND(1)*16 :PRINT"■";:GOTO60
120 FORI=1TOLEN(ME$)
130 CH=ASC(MID$(ME$,I,1))
140 X=(I-1)*5+XS
150 SYS 50432,X,Y,CH,COLOUR:NEXT
160 RETURN
```

Demonstration 3 — use of 4 x 4 characters

```
10 REM DEMONSTRATION 4
20 REM SCROLLS AND ROLLS
30 REM
40 PRINTCHR$(147)
50 PRINT"■■■■■■■■■"
60 PRINT"■■■■■■■■■"
70 PRINT"■■■■■■■■■"
80 PRINT"■■■■■■■■■"
90 PRINT"■■■■■■■■■"
100 PRINT"■■■■■■■■■"
110 FORI=1TO8:SYS 51742: NEXT
120 POKE 901,24: FORI=1TO96: SYS 52049: NEXT
130 POKE 901,12: FORI=1TO40: SYS 52049: NEXT
140 POKE 901,24: FORI=1TO19: SYS 51992: NEXT
150 POKE 901,24: FORI=1TO37: SYS 52123: NEXT
160 FORI=1TO16: SYS 51992: NEXT
170 FORI=1TO38: SYS 51826: NEXT
180 POKE 901,4: FORI=1TO12: SYS 52182: NEXT
190 POKE 901,25
200 SYS 52182: GOTO 200
```

Demonstration 4 — scrolls and rolls

Cosmic Kidnap 32K BBC £7.95

Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX

This is a complicated take-off of one of the oldest arcade games, Space Invaders. The lower section of the screen remains the same, but the marching intruders have been scrapped to be replaced by funny blue things (cronies). The mother ship has stayed, but there are now three alien captives in the middle of the screen, surrounded by a tough red wall.

It is your job as the Autoguard to stop the cronies dismantling the wall and so rescuing your prisoners.

You can lose one of your three lives by being hit by one of the bombs dropped from above, or if a prisoner is freed by a crony.

The normal left, right and fire controls are used and as soon as you have blasted all the cronies from one screen you immediately move to the next. From the third screen onwards you are often contronted with a menacing creature called the bug. He must be hit in a specific place and is worth 10 times more points than the cronies.

A definite must for all 'shoot 'em out of the sky' fans. **M.B.**

instructions	70%
playability	60%
graphics	60%
value for money	70%

★ ★ ★

Dragon Attack Sord M5 £19.95

Computer Games, CGL House, Goldings Hill, Loughton, Essex IG10 2RR

In this game you are a fighter robot and you must move right or left and fire missiles at dragons or UFOs. If you are hit by fire from the dragon, or if the dragon moves to the base of the screen you are knocked out. You can hide below shelters which gradually crumble under the fire of the dragons.

All this may sound strangely familiar, and so it should. Dragon Attack is a souped-up version of the now out-dated game of Space Invaders. Dragons, not invaders, descend in centipede fashion. One modification is that if a dragon is hit in the head, it will be completely knocked out; however, if it is hit in the torso, the torso disappears and the dragon divides into two. Tactics are therefore necessary.

Graphics and animation are adequate and the sound is good. However this type of game is now totally out of date, and I can't see people flocking to buy this. **S.S.**

instructions	80%
playability	60%
graphics	65%
value for money	60%

★ ★ ★

Galax Attax Dragon £12.95

Dragon Data, Kenfig Industrial Estate, Margam, Port Talbot, West Glam SA13 2PE

A machine code arcade game which to my mind closely resembles Space Invaders.

The enemy space craft progress in formation from the top of the screen dropping bombs as they go. If you do not shoot them first they can leave the formation to attack you. Movement to left and right is controlled by the joystick and the fire button shoots the missiles. There is nowhere to hide on the screen. You must keep on shooting and running until all your lives are lost.

The aliens come in three varieties. The score for each is doubled if you can hit it once it has left the formation.

Bonus points are awarded if a formation is completely destroyed. Another wave then appears. An extra ship is gained for every six convoys destroyed.

The screen display is adequate if unexciting. One of the aliens looks to me like a flying bowtie. The game loaded without any problems. The packaging is elaborate and concise instructions come in a small booklet.

A reasonable game of Space Invaders but I have seen more interesting versions. **J.E.M.**

instructions	60%
playability	60%
graphics	65%
value for money	60%

★ ★ ★

Blow up tanks, shoot down aliens!

Old favourites are adapted, with new modifications. See what our team of reviewers think

Tank Battalion Sord M5 £23.95

Computer Games, CGL House, Golding Hill, Loughton, Essex IG10 2RR

This is a game in which you control a tank in the middle of a battlefield. Enemy tanks slowly advance towards their goal — command headquarters. Your job is to defend by destroying the enemy tanks as they approach.... and so goes the accompanying informative instruction booklet.

Sounds exciting, doesn't it? Well, I'm afraid that Tank Battalion is nowhere near as exciting as it sounds. Basically, you take pot shots at the enemy tanks as they ramble around the screen and if you manage to destroy 20 before they blow up the command headquarters, which incidentally is represented as a flower, you go on to the next screen to do the whole thing all over again.

Your tank is a simple character, not a sprite, resembling a tank and the enemy tanks are just the same apart from their colour. Sound isn't very exciting either. There are some nice touches to this game, such as different street patterns for successive screens, realistic explosions, two players option and nice tunes, but at £23.95, I honestly can't recommend it. **S.S.**

instructions	90%
playability	60%
graphics	40%
value for money	40%

★ ★

Johnny Reb Dragon 32/ Tandy Colour £6.95

Lothlorien, 56a Park Lane, Poynton, Cheshire, SK12 1AE

From the makers of specialist Battle Games comes this simulation of the American civil war. There are two versions on one tape, one for the Dragon and the other for its near cousin the CoCo.

The game is one of strategy and there are many options for you to ponder over. The first is quite easy: do you wish to play the computer or another human being? After that they become more difficult.

You can set the game to a fixed number of moves: this means that games need not take too long and you have a result at the end. Then you must choose the size and composition of your army for the battle.

The battlefield is made up of different vegetation and a river with each unit. Any units which touch are in conflict and the computer decides the outcome. The game is visually good and very clear, as are the movement routines. I cannot judge how accurate the tactical adjustments are but I have enjoyed playing the game and will do so again. **D.C.**

instructions	90%
playability	90%
graphics	90%
value for money	95%

★ ★ ★ ★ ★

AGF JOYSTICKS INTERFACES

Programmable Interface

Hardware programmed, this interface attains Joystick or Trackball compatibility with ALL Spectrum or ZX81 software.

Without internal memories or tapes to load the direct addressing mode offers the fastest computer response to controller movement with programming being retained when the power is off.

Eight directional capability is automatically achieved by just setting up, down, left and right.

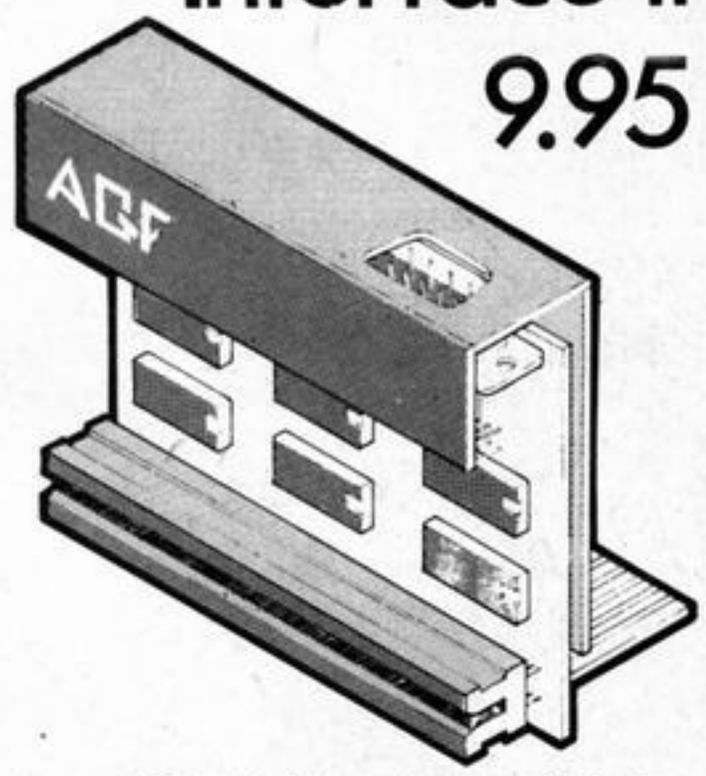
The hardware approach is totally compatible with all key reading techniques unlike memory programmed devices.

Supplied with Quick Reference Cards, to speed up setting to your favourite games, demonstration cassette and twelve months guarantee.

26.95 plus £1 post & packing

Interface II

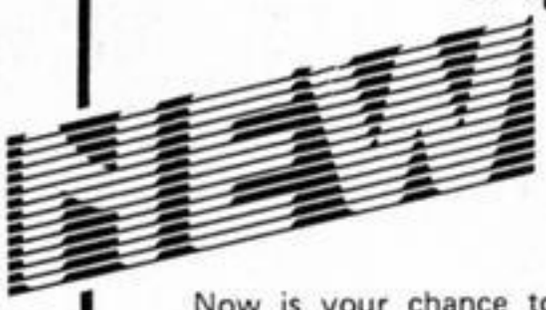
9.95



Now the AGF Interface II is even better value. Since we pioneered the cursor-key interface in October 1982 there are now over 100 games or utility programs with either the AGF option or cursor key controlled – that makes it unbeatable at this new low price.

Still incorporating the all important rear expansion connector which means other peripherals can be connected at the same time i.e Ram Packs, Printers, Speech Units etc, and of course the key replication principle used guarantees this will never conflict electrically with any other add-ons.

RomSlot



Now is your chance to enter the growing world of instant loading games.

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Dragon: praise and blame

I have recently bought a Dragon 32 and would like to tell you of my experiences with it.

Firstly, I would like to express my appreciation to Microdeal. I had one of their games, which appeared faulty. I wrote to them about it and promptly received a replacement. This was even without my sending the tape back. I very much appreciate this and I will certainly buy more of their products.

My second experience was with Dragon Data. My computer seemed to be faulty. It is only three-months-old, so I wrote to them explaining what was happening with it. I received a short letter back, listing two service agents both about 35 miles away from me and telling me to take it there. No mention of guarantee or any other help. I had also thought of upgrading to the Dragon 64, but I think it is a cheek for them to only offer me £80 in exchange for a three-month-old machine which cost over £150.

I am now seriously considering switching to another make. A software company such as Microdeal can be so efficient and concerned, so why can't the computer manufacturer? It seems Dragon Data consider themselves large enough not to care.

A. Wood, Castle Bytham, Lincs

Help with CBM 64 1

I read with interest and some concern about the difficulties experienced by your readers with CBM 64s. I believe that the problem lies with the readers' choice of supplier and not with the computer itself. We have found the Commodore machines to be well made and reliable, and we have only encountered minor problems.

I find it almost unbelievable that some dealers will change a faulty computer when a blown fuse is the problem, a common fault on the 64s. A little advice and some common sense is all that is required. Perhaps the following points will assist:

1 Never plug in or unplug the cassette unit, interface or cartridge into the 64 or VIC with the power turned on. A blown fuse, or worse, a damaged chip will result.
2 When removing the aerial/video lead, grip the plug, not the cable.
3 Do not obstruct the natural ventilation of the computer with covers etc whilst in use.
4 Do not connect non-approved devices, or tamper with the user port.
5 Cut off the braided lead on the C2N plug.
6 Clean the tape head regularly with a proprietary cleaner.

A problem does appear to exist on the latest model of C2N cassette unit, in that the Azmiuth setting has been found to be wrong.

Any approved Commodore dealer should be equipped to deal with this. The main point your readers would do well to remember is that many retailers are merely 'box shifters' and are not able or willing to give the sort of help a traditional dealer can. As they say, "you pays your money and you takes your choice."

In the event of any difficulty, we can help with both replacement aerial/video leads or cassette deck alignment if your readers contact us direct.

Paul Aldridge, Aldridge Audio, 54 Buck's Rd, Douglas, Isle of Man

Help with CBM 64 2

I am writing in reply to the letter from K. J. Morrison (HCW 57) concerning Commodore reliability. I have now owned both a VIC-20 (for 18 months) and a 64 (which is now 16-months-old) and have had no trouble at all with computer, cassette, disc drive, printer or connecting cables. I have also been able to elicit helpful and constructive replies to queries from Commodore UK.

The book supplied with the 64 is only intended as an operator's guide and, if detailed programming information is required, I would suggest an investment is made in the Programmers Reference Guide which is £9.95 and very good value for money. However it is still only a start on a very long road!

All purchasers of equipment must remember that they can help the quality control of software and hardware from Commodore UK by writing to them with CONSTRUCTIVE criticisms.

I must say in closing that all my hardware has been purchased from a one-man business and was all very carefully tested prior to delivery. Many thanks to Hemmings Electronics.

Keep up the good work with the magazine.

M. P. Sheppard, Letchworth, Herts

Cheap games are great 1

We were surprised to read the comments from Mr J Minter on the subject of lower priced quality software, which he seems to think is impossible.

Has he never heard of supermarkets? The general opinion, when they first appeared, was that they could not trade at a profit. Bulk purchasing has now become a recognised form of cost cutting, and at this time the only high street vendors making good profits are those which practise bulk buying wisely.

The principal behind low cost computer games is to sell as many as possible. This is achieved by reducing prices so as to increase demand and reduce the incentive for piracy. After all, who will buy a pirate version of a game when an authentic copy can be purchased from the local newsagents at just £1.99? Will it be worth the risk of prosecution for such a low return?

We have written two games for Mastertronic which did indeed take three months to complete and we think they are at least as good, if not better, from a technical point of view than anything we have seen from the overrated Mr Minter.

If he cannot make a living from selling his product (or more likely can't make the fortune he thinks is his right), then may we suggest that he joins his beloved Metagalactic Llamas at the End of Time.

We, however, only require a reasonable return on our labours. It is therefore up to the computer owner to decide whether he wishes to buy Mr Minter a Rolls Royce or us a Mini.

We would like to point out that the opinions expressed above are our own and may not be those of Mastertronic.

I. Goodman and M. Ellis

Cheap games are great 2

I read in HCW 57 about Mastertronic selling games for £1.99.

I have purchased two of these games for the Commodore 64 (BMX Racers and Moon Walk) for £1.99.

These games are of a good standard. If I was to buy more I would be prepared to pay £4.99 for them. I think this should catch on. I bought these games in a video rental shop.

Mark Thornton, Luton, Beds

Club together

Please give our club a mention in HCW. The Roche Computer Club meets at the Co-op Rooms, Roche, Cornwall, on Mondays and Fridays, starting at 7pm. Membership is £1.20 per year.

M.G. Richards, secretary, Roche, Cornwall

Mum likes micros, too

On the rare occasions when we see a letter from a woman in your magazine, why is it that they all seem to say: "I wasn't interested in computers until my husband/son had one, now I use it when they'll let me/when they're out/when I've nothing better, like the housework, to do."

Are there no women out there who have their own computers? I have my own Spectrum and spend hours on it, both programming and playing games, especially adventures. It isn't my only pastime, but it is definitely one of my favourites.

In case anyone is wondering, I'm not a young layabout with nothing better to do. I'm approaching 40, with two teenage daughters and a full-time job, and I run a Guide company in my spare time. I'm the only one in my family who is interested, though my daughters occasionally use the computer.

In conclusion, thank you for an interesting magazine, particularly the reviews. They save me a fortune, which might otherwise be spent on useless programs. Your reviews have never let me down yet. And thanks for the competitions: I won a couple of programs recently.

Liz Tomlinson, Havant, Hants

VIC-20 ROM error

I would like to inform owners of the VIC-20 of an interesting error message in the kernal ROM (the VIC's operating system), which I discovered while disassembling the LOAD and SAVE routines on my unexpanded VIC.

I found that bytes 61812 (Hex: F174) to 61920 contain the ASCII values of each letter of some I/O messages such as "PRESS RECORD & PLAY ON TAPE", "FOUND", "VERIFYING", etc. There is also a string containing the message "I/O ERROR". This error message is not mentioned in the manual.

Also of interest is the capital letter at the beginning of each message. This short program illustrates the above facts:

```
10 POKE36869,242:REM
   switch to lower case

20 FOR A=61812 TO
   61920

30 :PRINTCHR$ (PEEK
   (A));

40 NEXTA
```

Arun Kundnani, London N21

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ORIC PROGRAM

Make your micro make music

In this fairly short program you can play the notes within a given octave using the letters as shown on the screen.

As a tune is played the music is stored in the array X(X) and you can play it back later by pressing Y.

These are the keys for entering music:

S D G H J
Z X C V B N M

And these are the operational keys:

Q alters the octave (0-6), followed by 1 to lower or 2 to increase. Space bar returns you to entering music

W change the length of the note, followed by 1 to shorten duration or 2 to lengthen it. Space bar returns you to the menu

E ends the program

R allows you to alter the envelope shape, 1 to lower and 2 to increase the number

T alters the envelope period, again followed by 1 to shorten and 2 to increase

I have tried to keep the program fairly short and in order to do so I have only used one of the four available sound channels.

In addition, you can only

```
 1 REM ** SYNTHESISER **
 2 REM ** A PROGRAM FOR THE ORIC 1 --WORKS IN 16K AND 4
8K MACHINES **
 3 REM ** WITHOUT ALTERATIONS **
 4 REM
 5 REM ** S.W. LUCAS **
 10 TEXT:GRAB:PAPER7:INK4
 12 PRINTCHR$(6):REM TURN OFF KEY CLICK
 13 PRINTCHR$(17):REM TURN OFF CURSOR
 15 DIMX(1000):REM USED TO STORE MUSIC - MAKE LARGER IF
 YOU HAVE 48K
 17 CLS
 20 GOSUB1000:REM SET SCREEN DISPLAY
 25 B=20:C=3:D=5:E=200:Y=1
 30 GOSUB2000:REM GET NOTE AND PLAY IT!
 40 IFA$="Q"THENGOSUB3000:GOTO30:REM CHANGE OCTAVE
 50 IFA$="W"THENGOSUB4000:GOTO30:REM CHANGE DURATION
 60 IFA$="E"THENCLS:PLOT10,15,"THANK YOU FOR PLAYING":P
RINTCHR$(6)CHR$(17):END
 70 IFA$="R"THENGOSUB5000:GOTO30:REM CHANGE ENVELOPE
 80 IFA$="T"THENGOSUB6000:GOTO30
 90 IFA$="Y"THENGOSUB10000:GOTO30:REM REPLAY MUSIC
 999 END
 1000 FORX=20TO25:PLOT0,X,17:PLOT1,X,7:PLOT38,X,23:NEXT
 1010 PLOT3,24,"Z    X    C    V    B    N    M"
 1020 PLOT5,22,"S    D         G    H    J"
 1030 PLOT14,16,"KEYS USED"
 1040 PLOT3,19,"C    D    E    F    G    A    B"
 1050 PLOT12,18,"for the notes:-"
 1055 PLOT1,14,1:PLOT2,14,"          S. W. Lucas"
 1060 FORX=1TO2:PLOT10,X,X*2:PLOT11,X,14:PLOT12,X,"Mini
 synth":NEXT
 1500 RETURN
 2000 PLOT30,4,"KEYS":PLOT25,5,"Q= octave":PLOT25,6,"W=
 note length"
 2001 PLOT25,7,"E= end program":PLOT25,8,"R= envelope"
 2002 PLOT25,9,"T= period"
 2003 PLOT23,10,"Y= replay music"
 2004 REPEAT
 2005 A=0
 2030 GETA$:REM SET VALUE OF A FOR NOTE BEING PLAYED
 2040 IFA$="Z"THENA=1 ELSEIFA$="X"THENA=3 ELSEIFA$="C"T
HENA=5
 2050 IFA$="V"THENA=6 ELSEIFA$="B"THENA=8 ELSEIFA$="N"T
      HENA=10
       2060 IFA$="M"THENA=12
```

Turn your Oric into a musical instrument and play back your masterpieces. Steve Lucas wrote his synthesiser program for 16K or 48K models

```
 2070 IFA$="S"THENA=2 ELSEIFA$="D"THENA=4 ELSEIFA$="G"T
HENA=7
 2080 IFA$="H"THENA=9 ELSEIFA$="J"THENA=11
 2090 IFA<>0THENMUSIC1,C,A,0:PLAY3,0,D,E
 2095 Y=Y+1:REM INCREMENT NOTE
 2097 X(Y)=A:REM ADD NOTE TO SAVED MUSIC
 2100 WAITB
 2110 PLAY0,0,0,0
 2500 UNTILA$="Q"ORA$="W"ORA$="E"ORA$="R"ORA$="T"ORA$="
Y"
 2510 RETURN
 3000 PLOT30,4,"     ":PLOT25,5,"          ":PLOT25,6,"
          "
 3001 PLOT25,7,"               ":PLOT25,8,"               ":
PLOT25,9,"          "
 3009 PLOT10,4,"CHANGE OCTAVE"
 3010 PLOT10,5,"lower=1  higher=2"
 3020 PLOT9,6,"press <space bar> when ready"
 3025 REPEAT
 3030 F$=KEY$
 3040 IFF$="1"THENC=C-1 ELSEIFF$="2"THENC=C+1
 3050 IFC<=0 THENC=0
 3060 IFC>+6 THENC=6 :REM C=OCTAVE NUMBER
 3065 PLOT10,8,"OCTAVE No;-"
 3066 PLOT20,8,STR$(C)
 3070 UNTILF$=" "
 3080 PLOT10,4,"                                    "
 3090 PLOT10,5,"                                    "
 3100 PLOT9,6,"                                     "
 3110 PLOT9,8,"                                     "
 3120 RETURN
 4000 PLOT30,4,"     ":PLOT25,5,"          ":PLOT25,6,"
 4001 PLOT25,7,"               ":PLOT25,8,"               ":
PLOT25,9,"          "
 4009 PLOT10,4,"CHANGE DURATION"
 4010 PLOT10,5,"lower=1  higher=2"
 4020 PLOT9,6,"press <space bar> when ready"
 4025 REPEAT:F$=KEY$
 4040 IFF$="1"THENB=B-10ELSEIFF$="2"THENB=B+10
 4050 IFB<=0 THENB=0
 4060 IFB>70  THENB=70
 4065 PLOT10,8,"DURATION:-"
 4066 PLOT20,8,STR$(B)
 4070 UNTILF$=" "
 4080 PLOT10,4,"                                    "
 4090 PLOT10,5,"                                    "
 4100 PLOT9,6,"                                     "
```

How it works

10 sets colours of screen and text mode: GRAB allows the program to use the hi-res screen memory area.
12-13 turn off key click and cursor
15 DIMensions array X — used to store musical notes
20 calls screen display subroutine (lines 1000-1500)
25 sets default values of variables
30 calls subroutine at 2000-2510 which is the main routine for entering music
40 calls octave change subroutine, lines 3000-3120
50 calls note duration subroutine, lines 4000-4120
60 ends program when E is entered
70 calls envelope change routine, lines 5000-5210
80 calls routine to alter the envelope rise/decay times, lines 6000-6800
90 calls the REPLAY subroutine lines 10000-10060
1000-4100 subroutines called by lines above

store 1,000 notes in array X before an error occurs. This is to make it compatible with the 16K Oric. If you want to write longer pieces you must increase the DIM statement in line 15.

Main variables

X(X) musical notes written
S$ key pressed
A note
B duration of WAIT command
C octave
D envelope mode
E envelope period
Y number of notes in array

Note: Use the space bar, or any other key, for a pause. I would recommend that you write the music and then alter the envelopes to investigate the different effects.

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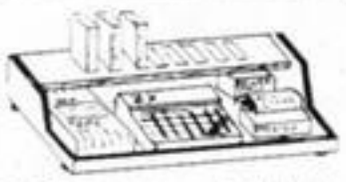

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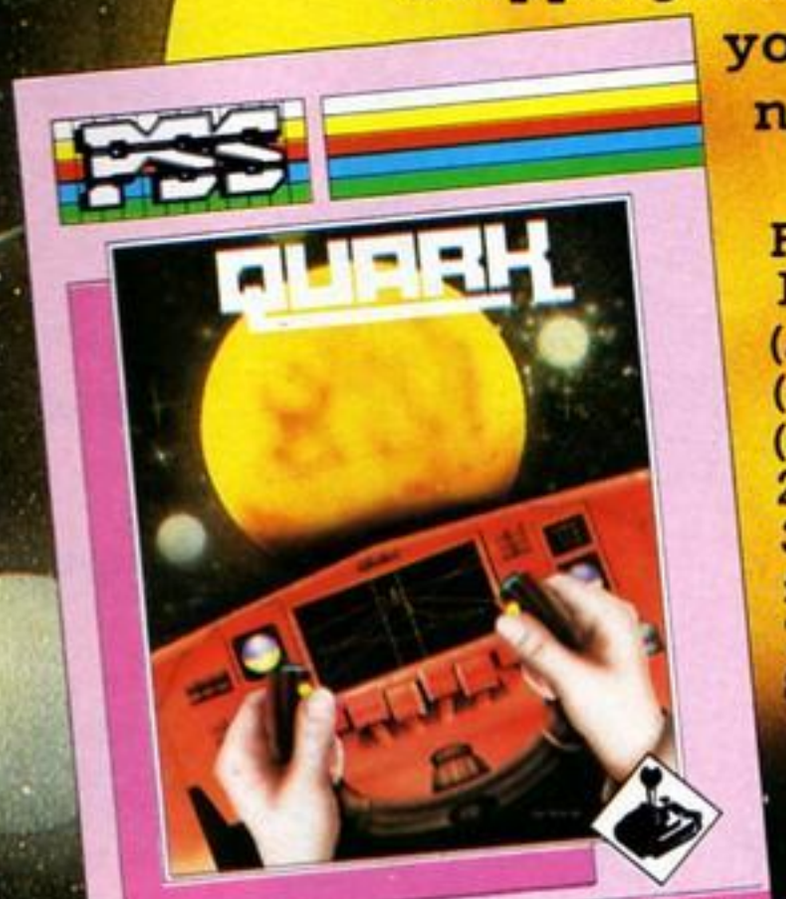

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